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M E X I C O .

A GEOGRAPHICAL SKETCH,

WITH SPECIAL REFERENCE TO

ECONOMIC CONDITIONS AND PROSPECTS
OF FUTURE DEVELOPMENT.

COMPILED BY
THE BUREAU OF THE AMERICAN REPUBLICS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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NOTE.

For the convenience of those not familiar with the Spanish language, the following general rules are appended concerning the pronunciation and the value of the accent of Spanish words.

All vowels are pronounced and have invariably the same sounds under all conditions. A is pronounced *ah*; e, *eh*; i, *ee*; o, *oh*; u, *oo* (as in good); e. g., Ta-mau-li-pas is pronounced Tah-mah-oo-leeh-pahs.

The letter *h* is never pronounced, except when it follows the letter *c*, when it is pronounced as in English; e. g., Co-a-hui-la and Chi-hua-hua are pronounced Coh-ah-oo-eeh-lah and Chee-oo-hah-oo-hah.

J is always pronounced like the English *h*; thus Jalisco is Hah-lees-co.

Guc, *gui*, and *que*, *qui* are pronounced as in English.

Z is pronounced very nearly as *th* in *thought*; and X, in names of towns, cities, etc., in México, is pronounced like *h* in English; Oaxaca being *Oahaca*; México, *Méhico*.

Words ending in any consonant excepting *n* and *s* have the stress on the last syllable; e. g., Tepic, pronounced Tepíc. Words ending in a vowel have the accent or stress on the penultimate, as Colima, pronounced Colíma. Exceptions bear the mark (') on the letter where the accent falls.

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MEXICO.

CHAPTER I.

GEOGRAPHICAL SKETCH.

The country called Méxicò, or New Spain, by the historians of the last century was situated between 9° and 40° north latitude, and 80° and 50° west longitude. Its length was 2,100 miles, and its breadth 1,600.

The United Mexican States of to-day, according to the latest official data, lie between $14^{\circ} 30' 42''$ and $32^{\circ} 42'$ latitude north, and $86^{\circ} 46' 8''$ and $117^{\circ} 7' 31''$ longitude west from Greenwich, having a superficial area of about 767,326 square miles. The northern and eastern boundary of the Republic is the United States of America; the eastern, British Honduras, the Caribbean Sea, and the Gulf of México; its southern, the Pacific Ocean, Guatemala, and British Honduras; and the western, the Pacific Ocean. Its greatest length is about 1,900 and its greatest width 750 miles. The eastern coast line is 1,727 miles long, and the western 4,574 miles. The widest part is along its boundary with the United States, and the narrowest the Isthmus of Tehuantepec, where the distance from ocean to ocean is only about 100 miles.

The boundary with the United States, as fixed by the treaties of February 2, 1848, and December 30, 1853, begins at the mouth of the Rio Grande on the Gulf of México and follows the river for 1,136 miles beyond El Paso, Tex., to the point where it meets parallel $31^{\circ} 47'$ latitude north, thence along said parallel for a distance of 100 miles; thence south to parallel $31^{\circ} 20'$ north latitude, following this parallel in a westerly direction as far as the one hundred and eleventh meridian of longitude west from Greenwich. Thence it runs in a straight line to a point on the Colorado River 20 miles below the junction of the Gila, thence up the middle of said Colorado River to the intersection with the old line between Upper and Lower California, and thence to a point on the Pacific Ocean distant 1 marine league due south of the southernmost point of the Bay of San Diego, the total distance from El Paso, Tex., to the Pacific being 674 miles.

The whole extent of the boundary between the two countries is 1,833 miles. As this boundary line runs from the southeast to the northwest, México has on the Pacific side $6^{\circ} 34' 20''$ of latitude more than on the Gulf side.

Owing to the discovery of mines in the immediate vicinity of the boundary line some years later, difficulties arose regarding the exact location of the line and the destruction of some of the original marks. A convention was then concluded between the two Governments at the city of Washington on the 29th of July, 1882, providing for the appointment of an International Boundary Commission to ascertain the condition of the monuments marking the boundary line, a preliminary reconnoissance of the same line to be made by both Governments in accordance with the stipulations of the convention. The reconnoissance was made in 1883 by officers of both Governments, independently, and their respective reports were submitted showing the necessity of a more definite demarkation of the boundary line. The other stipulations of this convention were not carried into effect in due time, and another convention to revive and continue the same was concluded at Washington between the two Governments on the 18th of February, 1889. In compliance with this new convention the officers appointed by the two Governments began the work assigned to them, and presented their joint report dated Washington, August 14, 1896.¹

The boundary with Guatemala is fixed by the treaties of September 27, 1882, and April 1, 1895. It runs from a point on the Pacific coast, 3 leagues distant from the upper mouth of the river Zuchiate, to the Caribbean Sea, following the course indicated by the treaties. The boundary with Belize is defined by a treaty signed at the City of México on July 8, 1893, and ratified by the Mexican Senate on April 19, 1897. This line runs from the mouth of Boca Bacalar Chica—a strait separating Yucatán from Ambergris Key—to the boundary between México and Guatemala, following the demarkation set forth in the treaty.

By the treaties known as the Guadalupe-Hidalgo treaty, February 2, 1848, and the Gadsden treaty, December 30, 1853, México ceded to the United States 930,590 square miles, or over one-half of her former territory. The area of each of the Mexican cessions to the United States is estimated as follows:

	Square miles.
Annexation of Texas	362, 487
By Guadalupe-Hidalgo treaty	522, 568
By Gadsden treaty	45, 535
Total	930, 590

The country possesses a curious physical formation. Rising rapidly by a succession of terraces from the low sandy coasts on the east and

¹ Report of the International Boundary Commission, United States and Mexico, 1891-1896.

west, it culminates in a central plateau running in a northwesterly and southeasterly direction, and having an elevation varying from 4,000 to 8,000 feet above the sea. High above this plateau tower the snow-capped crests of several volcanoes, most of which are extinct. The highest peaks are the volcanoes of Popocatepetl, 17,540 feet; the Orizaba or Citlaltepétl, 17,362 feet; the Ixtacihuatl, 16,076; Toluca, 15,019; Colima, 14,363; and Ajusco, 13,628 feet, besides several others varying from 4,000 to 13,000 feet in height.

Two cordilleras, or high mountain ranges, traverse México, running almost parallel to the coast, one along the Gulf of México and the other along the Pacific coast. The former runs from 10 to 100 miles from the coast, leaving an imperceptibly inclined plane between the sea and the foot of the mountains, while the cordillera on the Pacific side runs very near the coast, leaving a very narrow strip of land between the mountains and the sea. This range has several branches running in different directions, the most continuous being the Sierra Madre of the Pacific. Parallel to this last-named range is the Sierra de la Giganta in Lower California, which slopes abruptly toward the east like the Atlantic escarpments. Corresponding with the Sierra Madre on the west are the broken eastern scarps of the central plateau.

The cordillera of Anahuac, which surrounds the valleys of Tenochtitlan and Puebla, is the most important orographically and historically of the central cross ridges and is supposed to culminate in Popocatepetl and Ixtacihuatl. It seems, however, that these volcanoes belong to a more recent upheaval as they are nearly at right angles to the main axis of the central plateau, south of the line formed by the Orizaba or Citlaltepétl, on the coast south of Veracruz, to which correspond, on the west, the Jorullo, in Michoacán, Colima, near the coast in Jalisco and the Revillagigedo group on the Pacific. Nearly parallel to these are the sierras of Guerrero and southeast of the Isthmus of Tehuantepec those of Oaxaca and Chiapas toward the frontier of Guatemala. In the course of time these mountains have become disintegrated by rain and other natural causes, and the filling up of the spaces between them has formed a series of valleys rich in agricultural resources. These valleys, known as the central plateau, run for about 150 miles east of the City of México, in a northwesterly direction. The plateau is so level that when there were no wagon roads in México one could travel in a carriage from the City of México to Santa Fé. In contrast with the plains and the at times barren districts of the plateau, the territory is occasionally broken by depressions called "barrancas," having in some instances a depth of 1,000 feet and being several miles in length. These are covered with a luxurious growth of trees and shrubs and watered by small streams running through the middle of the valley. Among the most remarkable are the Barranca de Bertrán, on the western slope from Guadalajara to Colima, and the Mochitiltl from Guadalajara to Tepic.

The eastern coast of México, bathed by the Caribbean Sea and the Gulf of México, is flat, low, and sandy, except near the mouth of the Tabasco River, where, at some distance from the coast, appear the heights of San Gabriel, extending northeast and southwest for several miles. The coast on the Pacific side, though generally low, is here and there broken by spurs extending from the cordilleras to the ocean.

The principal gulfs are the Gulf of México, the Gulf of California, and the Gulf of Tehuantepec, the first named ranking among the largest in the world. The only bays worthy of notice are those of Guaymas, Santa Bárbara, Topolobampo, and Navachiste, in the Gulf of California; Concepción, La Paz, and Mulejé on the west coast of the same gulf; San Quintín, Magdalena, and Amejas, on the Pacific coast, in Lower California, and San Blas and Valle de Banderas on the coast of Tepic.

The largest lake on Mexican territory is the Chapala Lake, measuring over 80 miles in length by 30 in breadth. The Valley of México has seven lakes, one fresh and six salt water, the three largest being Chalco, Xochimilco, and Texcoco. The other lakes in México are Catemaco, in the State of Veracruz, Cariel and Carpintero in the State of Tamaulipas; Encantado, in Tabasco, Bacalor, in Yucatán; Alcuzaque, in Colima; Cuitzé, Tacasquaro, and Patzcuaro, in Michoacán; Yuriría, in Guanajuato, and Meztitlán in Hidalgo.

México has a great many islands near the coasts, none of them very large and most of them uninhabited, although some are of great fertility and are capable of supporting a large population. Among the most important are, El Carmen, the largest in the Gulf of México; San Juan de Ulúa and Sacrificios, opposite the port of Veracruz; Mujeres, in the Caribbean Sea; Guadalupe, about 75 miles from the west coast of Lower California; Tres Marías, a group off the same coast; the Revillagigedo group, near the coast of Colimas and Alcatraz Island, not far from the coast of the State of Michoacán.

The principal rivers of México are the Rio Grande, 1,500 miles long, forming, from El Paso, Tex., to the sea, the boundary line between the United States and México; the Lerma or Santiago, 540 miles long; the Mescala or Balsas, 426 miles in length; the Yaqui, 390 miles; the Grijalva, 350 miles; the Fuerte, 340 miles; the Usumancita, 330 miles, and several others. The topographical conditions of the country are such as to cause the streams, in their progress toward the sea, to be continually precipitated in the form of cascades, etc., thus rendering navigation exceedingly difficult on account of their varying depths, but greatly facilitating their availability for motive power. The Rio Grande rises in Colorado (United States of North America), passes through New Mexico, and by the time it reaches Mexican territory it is almost dry, as the inhabitants of both States have utilized the greater portion of its waters for irrigation purposes. After passing

Presidio del Norte (Ojinaga), the river Conchos and other tributaries supply the Grande with water, thus enlarging its stream, though never to the extent attained before its passage through Colorado and New Mexico. The Mescala or Balsas River rises in the central plateau, near the Valley of México, passes through the State of Puebla to the southwest, and empties into the Pacific at Zacatula. This river is navigable for a short distance along its lower reaches; above the bar it is accessible to small craft. The Pánuco River rises north of the Valley of México, and under the names of Tula and Montezuma it describes a vast semicircular bend toward the west across the Hidalgo uplands and receives the streams of the Huasteca of Veracruz and Tamaulipas, beyond which it is joined by the various streams flowing from Querétaro, and finally empties into the Gulf of México at the port of Tampico, which is at present the best harbor on the Gulf coast. The River Lerma, or Santiago, is also a considerable stream. It rises in the mountains southwest of Toluca, passes through the Lake of Chapala, which it leaves under the name of Guadalajara, changing again its name to Tololotlán and Santiago before it empties near San Blas, having received the waters of many tributaries. The Grijalva and Usamacinta rivers rise in the State of Chiapas, and, after being joined by many streams coming from Guatemala, empty into the Gulf of México at the city of Frontera, in the State of Tabasco. The Papaloapam rises in the State of Oaxaca, passes through the State of Veracruz, and empties into the Gulf of México at the town of Alvarado, a few miles south of Veracruz. There are also several other rivers more or less important. In all, there are in México 95 streams worthy of mention, their total extent being 32,400 kilometers, 10,000 of which are navigable for ships of great draft, 1,800 for canoes and small steamers not exceeding three feet in draft, and the remaining 10,600 kilometers are useless for navigation, but suitable for irrigating purposes and in many cases for motive power.

Señor Matías Romero¹ makes the following report on the geological conditions in México:

“The geology of México has been but imperfectly studied. In the higher ranges the prevailing formations are granite, which seem also to form the foundations of the plateaus, above which rise the traps, basalts, mineral-bearing porphyries, and more recent lavas. Hence Lyell’s theory that México consisted originally of granite ranges with intervening valleys subsequently filled up to the level of the plateaus by subterranean eruptions. Igneous rocks of every geologic epoch certainly form to a large extent the superstructure of the central plateau. But the Mexican table-land seems to consist mainly of metamorphic formations which have been partly upheaved, partly inter-

¹ Coffee and India-rubber Culture in Mexico; New York, 1898, p. 12.

penetrated and overlaid by igneous masses of all epochs and which are chiefly represented by shales, greywacke, greenstones, silicious schists, and especially unfossiliferous limestones. All these formations are alike remarkable for the abundance and variety of their metalliferous ores, such as silver, silver glance, copper, and gold. Gneiss and micaceous schists prevail in Oaxaca and on all the southern slopes facing both oceans. But the highest ranges are formed mainly of plutonic and volcanic rocks, such as granites, syenites, diorites, mineral-bearing trachytes, basalts, porphyries, obsidian, pearlstone, sulphur, pumice, lavas, tufa, and other recent volcanic discharges. Obsidian (itzli) was the chief material formerly used by the natives in the manufacture of their cutting implements, as shown by the quarries of the Cerro de las Navajas (Knife Cliff), near Real del Monte and Pachuca, in the State of Hidalgo. Vast deposits of pumice and the purest sulphur are found at Huichapam and in many of the craters. But immeasurably the most valuable rocks are the argentiferous porphyries and schists of the central plateau and of Sinaloa, unless they are destined to be rivaled by the auriferous deposits of Sonora. Horizontal and stratified rocks, of extremely limited extent in the south, are largely developed in the northern States and chalk becomes very prevalent toward the Rio Grande and Rio Gila valleys. To this chalk and to the sandstone are probably due the sandy plains which cover vast tracks in North México, stretching thence far into New México and Texas. Hence, the Bolsón de Mapimi, a vast rocky wilderness inhabited until recently by wild tribes, occupies a space of perhaps 50,000 square miles in Coahuila and parts of the surrounding States.

“None of the horizontal layers seem to be very rich in ores, which are mainly found in the metamorphic, Paleozoic, and hypogene rocks of Durango, Chihuahua, and the south. Apart from Sinaloa and Sonora, which are now known to contain vast stores of the precious metals, nearly all the historical mines lie on the south central plateau at elevations of from 5,500 to 9,500 feet. A line drawn from the capital to Guanajuato, and thence northward to the mining town of Guadalupe y Calvo of Chihuahua, and southward to Oaxaca, thus cutting the main axis of upheaval at an angle of 45° , will intersect probably the richest known argentiferous region in the whole world.

“Of other minerals the most important are copper, found in a pure state near the city of Guanajuato, and associated with gold in Chihuahua, Sonora, Guerrero, Jalisco, Michoacán, and elsewhere; iron in immense masses in Michoacán and Jalisco and in Durango, where the Cerro del Mercado is a solid mountain of magnetic iron ore; lead associated with silver, chiefly in Oaxaca; tin in Michoacán and Jalisco; sulphur in many craters; platinum, recently found in Hidalgo; cinabar, also recently found in Morelos and Guerrero; ‘steppe salt’ in the

sandy districts of the north; 'bitter salt' at Tepayac and many other places; coal at various points; bismuth in many parts; marble, alabaster, gypsum, and rock salt in great abundance throughout the plateaus and sierra."

The geographical position of México gives it a great diversity of climate. The heat of the torrid zone is experienced on the seacoast and the low, marshy tracts bordering on the Gulf of México, and in the valleys shut in by mountains 3,000 feet above sea level. The night breezes, however, bring compensation for the heat of the day, and the rains, which begin usually in June and last until November, are so abundant and fall so regularly that they refresh the atmosphere and are the main reliance of the agriculturist. So decided is the effect of the rains on the atmosphere that the seasons are divided into two only, viz, the rainy and the dry season. Trees are never entirely denuded of their foliage, but as each leaf falls through age it is immediately replaced by another, thus the bare autumnal limbs incident to northern climes are unknown.

The differences in climate, dependent upon the different degrees of altitude, are so great in México that the vegetable products of the country embrace all that can be found between the Equator and the Polar Circle.

The mean temperature in the hot regions varies from 77° to 82° F., and often rises to 100° , and in some coast localities to 105° .

The temperate zone lies between 3,000 and 5,000 feet above sea level. Here the mean temperature is from 62° to 70° F., the variation during the season being not more than 4° or 5° . This may be called the region of eternal spring. Semitropical productions have their homes here, mingled with the products of both the tropical and cold regions. In this privileged region both extremes of heat and cold are unknown and in it are found several cities, among others Jalapa and Huatusco, in the State of Veracruz, Chilpancingo in Guerrero, and Ameca in Jalisco. There are farms here where wheat and sugar cane grow on the same parcel of ground.

Between 7,000 feet above the level of the sea and greater heights lies the cold region, having a mean temperature of from 59° to 60° F. Here the rainfall is five times less than in the temperate zone. The changes of temperature are but small from one end of the year to the other, although the diurnal changes between sunrise and sunset are often considerable.

The climatic conditions of México are undergoing great changes on account of the destruction of the forests. Rains were formerly very abundant and the atmosphere very moist, the country being covered with thick forests, but with the difficulty experienced in transporting the coal of the country, the population has had to depend entirely for their supply of fuel upon charcoal, thus denuding the mountains and

changing very materially the climatic conditions of some regions. The case is different, however, in the lowlands, which are sparsely populated and where the country is still so thickly wooded that passage through them is impossible unless a path is made by felling large trees and clearing away the underbrush and weeds. In these regions mahogany, cedar, rosewood, etc., abound.

The most thickly populated region lies in the central plateau, high above sea level, and so well protected from the winds and storms by mountains that the climate is even, temperate, and delightful. The late Mr. Romero, from whose work, "Mexico and the United States,"¹ much valuable data have been procured in the preparation of this work makes the following remark (p. 37): "The impression prevails in the United States that México, lying to the south and running toward the Equator, must be much warmer than this country; but this is not so. Even in warm places, like the lowlands on the coast, we do not have the extreme hot weather that is experienced in summer in the United States. The sea breezes refresh the atmosphere at night and cool it considerably, making, therefore, a very great contrast with the summer heat in this country. The medium climate of the Valley of México, for instance, which is the one that has been best observed and understood, varies comparatively little between summer and winter, its greatest variations being between day and night on the same day."

It may be said that the climate of México, if not the most invigorating is, without doubt, one of the most delightful in the world. The region of temperate lands and oceanic slopes enjoys a perpetual spring, being exposed neither to the severity of the northern winter season nor to the extreme of summer heat.

The flora of México is unrivaled. It has been remarked that the most striking characteristic of the Mexican flowers is their rich color. The prevailing hue of the flowers is always rich and brilliant. There can be no more pleasing or extensive field for the botanist than the tropical forests of México, in whose deep shades bloom the most exquisitely tinted flowers and orchids. In the vicinity of Orizaba, a locality almost incomparable as regards the great variety of flowers, orchid collectors may find a paradise.

In the valley of México there is no day in the year that finds the markets wanting in beautiful roses and flowers to delight the eye and regale the senses, and the marvelous size the calla lillies, heliotrope, camelias, and poppies attain arrests wondering attention. There are about 50 varieties of lilies blooming in varied garb in this valley. Each belt—the hot, the temperate, and the cold—displays its own peculiar varieties of flowers, and in each has nature spread her most gorgeous colors, her fairest tints, and her sweetest perfumes.

¹ Published by G. P. Putnam's Son, New York, 1898.

The arboreal vegetation of the country embraces 114 different species of building and cabinet woods, among them being the pine, oak, fir, cedar, mahogany, rosewood, ironwood, etc.; 12 kinds of dyewoods; 8 of resinous trees—the cacao and india rubber, copal, liquid amber, camphor, turpentine, mesquite, dragon's blood, and the mastic. There are 17 varieties of oil-bearing trees and plants, among which are the olive, almond, sesame, flax, cocoa palm, Peruvian balsam, etc.

The country is especially rich in medicinal plants, there being no less than 59 classified species of these, and many more still unclassified.

Fibrous plants abound and their products form a large proportion of the export trade. The best-known fibers are the heniquéen or sisal hemp, the ixtle, pita, maguey, jute, flax, ramie, aloe, and cotton.

Of Mexican fruits and tobacco so much has been written that it is only necessary to say that through the diversified climate of that favored land it enjoys the fruits of every clime, and that these reach perfection in size and taste. The varieties are infinite. There are no less than twenty kinds of bananas. At the Philadelphia Commercial Museum, México had on exhibition 1,036 samples of her woods, 18 of dyewoods and substances, 68 of gums and resins, 369 of medicinal plants, and 152 of textile fibers. A great quantity of red cedar is exported from the State of Veracruz to the United States for the manufacture of cigar boxes. There is a sawmill in this State, owned by a German, which is engaged in cutting up red cedar logs for such use, having a capacity of 4,000 tons of lumber a year. At the Tennessee Centennial Exposition there were exhibited some bamboos from the State of Veracruz 40 feet in length. The local name for these giant bamboos is "tarros."

The animal kingdom is almost as extensively represented in the territory of México as the botanical. There are three species of large felidæ—the puma, jaguar, and ocelot. Wolves, coyotes, and wild-cats are numerous in the northern States. A specie of sloth inhabits the southern forests, which also contain five varieties of monkeys. Other wild animals are beavers, moles, martens, and otters. The armadillo and iguana are very common, and are used by some of the natives as food. Venomous serpents and noxious insects lurk in the forests of the hot lands. The mountains and foothills present a veritable paradise to the sportsman—deer, hare, rabbits, quail, wild pigeons, partridges, and an infinite variety of birds and ground game abounding. Horses, cattle, sheep, and goats are found almost everywhere, and, are the source of much wealth and industry.

The birds of México are far-famed for their brilliant plumage and singing qualities. In the hot lands the birds are more distinguished for beauty of plumage than melody of voice, their coloring being as varied as that of the flowers; but in the colder belts splendid songsters fill the air with thrilling notes. A list of the feathered inhabitants of the country includes 353 species.

Sperm and gray back whales, seals, and sea lions abound in the western waters of Lower California and in the gulf of that name. The waters of both coasts, as well as the rivers and mountain streams, teem with a great variety of fish.¹ Alligators infest the river mouths of both coasts. Turtles of all kinds are also found in abundance on the coasts. Tortoises exist in the waters of Yucatán and Lower California, as well as on the coasts of Sinaloa. The shell is an important article of export, amounting to about \$20,000 a year. Near La Paz, in the Gulf of California, extensive beds of pearl oysters exist.

Señor Don Antonio García Cubas² mentions 52 varieties of mammal quadrupeds as existing in the Republic, and 203 varieties of fowls, including domestic fowls, as well as over 50 kinds of humming birds, differing in color and shape and forming a chromatic scale of brilliant tints, running from sea green through bluish green to emerald green, and from the lightest straw color to the deepest scarlet and fiery red. Of reptiles the authority cited enumerates 43 classes, and of batrachians 13 species.

Among insects, those claiming attention are the cochineal (*Coccus cacti*) and the honey bee, because of the excellent materials they produce beneficial to industry and to commerce. The former insect is cultivated in Oaxaca, living on the prickly-pear cactus, and producing a red liquid dye. Winterbotham, one of the last century's historians, in his *History of America*, relates that the trade in cochineal by the city of Oaxaca alone in the year 1796 amounted to 200,000 crowns in value.

The bee is to be found all over México, busily producing great quantities of honey and wax.

The silkworm, although comparatively neglected, is said to yield an annual profit of \$40,000.

The country offers a vast and rich field to the naturalist and entomologist for the study of the innumerable species of coleopter, there being no less than 77,000 of these catalogued.

Baron von Humboldt, who at the beginning of the century visited México, in his work "*Political Essay of New Spain*," quotes at length a census made in 1810 by Dr. Fernando Navarro y Noriega, according to which the total population of México amounted then to 6,122,354 inhabitants, divided as follows: Europeans, including ecclesiastics and nuns, 18 per cent; Indians, 60 per cent, and mixed races, 22 per cent. In 1875, according to the census, the total population had increased

¹Since 1891 the Government has devoted much attention to pisciculture. It established fish hatcheries and introduced large quantities of carp, trout, and salmon trout.

²Los Estados Unidos Mexicanos, 1893—México.

to 9,495,157 inhabitants, divided as follows: Europeans and descendants of the Spaniards, 20 per cent; mixed races, 43 per cent, and native Indian race, 37 per cent.

During the sixty-five years that elapsed between the two above-mentioned censuses, deducting from the census of 1810 the inhabitants of Texas, New Mexico, and Upper California (estimated at 58,338 individuals), the increase of the population was 3,431,141, showing an increase in the European element of 1.1 per annum and in the mixed race 3.25, while the native Indian decreased at the rate of 0.58 per annum.

The population of the country in 1879 amounted to 9,908,011 inhabitants, and in 1895, according to the last official census, had increased to 12,619,949, as shown in the following table, prepared from the census of October, 1895, and the census of 1879:

States.	Area in English square miles.	Population.		Capitals.	Population. 1895.
		1895.	1879.		
Aguascalientes	2,951	104,615	140,430	Aguascalientes	30,872
Campeche	18,095	88,302	90,413	Campeche	16,647
Chiapas	27,230	319,599	205,362	Tuxtla Gutierrez	10,952
Chihuahua	87,820	262,771	225,541	Chihuahua	18,279
Coahuila	62,376	241,026	130,026	Saltillo	26,801
Colima	2,273	55,752	65,827	Colima	18,977
Durango	38,020	286,906	190,846	Durango	26,425
Guanajuato	11,374	1,062,554	834,845	Guanajuato	39,404
Guerrero	25,003	417,621	295,590	Chilpancingo	6,312
Hidalgo	8,920	558,769	127,350	Pachuca	40,487
Jalisco	31,855	1,107,227	983,484	Guadalajara	83,934
México	9,250	841,618	710,579	Toluca	23,150
Michoacán	22,881	894,753	661,534	Morelia	33,890
Morelos	2,774	159,355	159,160	Cuernavaca	8,747
Nuevo León	21,324	309,252	203,284	Monterrey	45,695
Oaxaca	35,392	884,909	714,000	Oaxaca	32,437
Puebla	12,207	984,113	781,466	Puebla	88,684
Querétaro	3,558	228,551	203,250	Querétaro	34,576
San Luis Potosí	25,323	568,449	516,486	San Luis Potosí	69,050
Sinaloa	23,681	258,865	186,491	Culiacán	10,487
Sonora	76,922	191,281	115,424	Hermosillo	8,474
Tabasco	10,075	134,839	104,747	San Juan Bautista	9,604
Tamaulipas	32,585	206,502	140,137	Ciudad Victoria	14,747
Tlaxcala	1,595	466,803	138,988	Tlaxcala	2,847
Veracruz	29,210	866,355	542,918	Jalapa	18,168
Yucatán	35,214	298,850	302,315	Mérida	36,935
Zacatecas	21,764	452,578	422,506	Zacatecas	39,212
TERRITORIES.					
Tepic	11,279	148,776	.....	Tepic	16,226
Baja California	58,345	42,245	30,208	La Paz	4,737
Federal District	463	476,613	351,804	Ensenada de Todos Santos	1,259
Islands	1,471	.....	.....	City of México	329,774
Total	76,226	12,619,949	9,908,011		

Of the total population, it is said that 22 per cent are of the white race, 31 per cent native Indians, and 47 per cent mixed races. The custom of tribal intermarriage and improper methods of caring for the young in the matter of nutriment and clothing, as well as other causes, is rapidly decreasing the Indian race. Density of population is estimated at 6.36 inhabitants per square kilometer.

CHAPTER II.

HISTORICAL SKETCH.

An impenetrable mist of fable envelops the early history of México. Scientific investigation and archeological research have not yet lifted the veil to disclose the original inhabitants of that country. Ruins and hieroglyphics in different portions of the Republic reveal the story of a series of immigrations from the north toward the south, but the point from which the movement began has not been determined.

Mexican historians generally agree, founding their theories on the interpretations of hieroglyphics and upon the ancient ruins, that the country was invaded by seven families successively immigrating from the north, all speaking the same language, the Nahuatl or Mexican; but history does not reveal the starting point of these races nor disclose the mystery of the multiplicity of languages of so diverse a character spoken by the many tribes that followed them, nor the causes that impelled them to abandon their former homes. According to the Mexican scholar Pimentel, not one of the 108 indigenous tongues bears any analogy to Asiatic tongues, but certain resemblances to the language of the Esquimaux would indicate direct communication between Asia and America.

The annals of the Toltecs have furnished a starting point for the history of México. These composed a semicivilized nation who inhabited a country called Huehueltlappallan, toward the north of the continent, where they built cities and temples and were versed in agriculture, the arts, and the computation of time. Owing to civil disturbances, the Toltecs, with a number of their partisans and neighbors, in the year 544 A. D., were expelled from their country and began their wanderings southward, founding cities on their way.

One hundred and seventeen years after leaving their country they reached the present site of Tula (50 miles north of the City of México, on the line of the Mexican Central Railroad), where they laid the foundation of their powerful kingdom. This tribe remained here until overthrown by the "lords of Jalisco," in 1116, eleven "monarchs" having reigned.

There is a notable event in the history of the Toltecs which deserves mention, as it is well authenticated. It is the origin of the universal and famous Mexican beverage pulque in the reign of the eighth Toltec chief, Tēpaucaltzin, in the latter half of the eleventh century. It is

narrated that a noble named Papantzin discovered the method of extracting the juice of the maguey plant, of which it is made, and sent some of the fermented liquid to his chief by the hand of his daughter, the beautiful Xochitl, called the Flower of Tollan (Tula). The chief, enamored both of the drink and the maiden, retained the latter a willing prisoner, and she became the mother of his illegitimate son, who afterwards wielded the scepter. This incident inaugurated the troubles of the Toltecs.

After the dispersion of the Toltecs, a roving tribe, the Chichimecas, hearing of the former's overthrow, occupied the abandoned country, starting for it from the north in 1117.

Other tribes of the original seven successively descended from the north and spread themselves over the valley of México, founding cities and erecting temples and palaces.

The last tribe to reach the valley was the Aztec, or Mexican, whose annals claim the greatest interest in the history of México. This tribe is supposed to have originally come from the north of California, according to the historian Clavijero, their country being called Aztlan. They reached Tula in 1196, remaining there nine years, and spending eleven in other parts of the valley. At the expiration of this time they arrived in Zumpango, 30 miles north of their future capital. Here they were well received, and the chief's son married a daughter of one of the Mexican families. From this marriage sprang the military chiefs of the Mexicans.

After many wanderings they settled on the marshy islands near the western borders of Lake Texcoco, and there, in the year 1325, was established the nucleus of the city first called Tenochtitlan, derived, according to some authorities, from Tenoch, one of their priests and leaders. Other authorities claim that the name comes from Tenuch (prickly-pear cactus), as there is an old legend that the leaders of the tribes of Mexicans, wandering in search of a place of rest, saw an eagle standing upon a cactus strangling a serpent on the site of the City of México. This legend has been generally accepted, and gave México the design for its escutcheon. The present name of the city finds its source in the name of the Aztec's god of war, Mexitli, also known as Huitzilopochtli. The name of the country demonstrates the hold the maguey plant had upon the ancient tribes. Mexican traditions, as preserved in the most ancient writings, relate that this god Huitzilopochtli was born of a virgin belonging to the noble family of Citli (free and ancestral); that his cradle was the heart of a maguey plant (metl), and hence the name of Mecitli, afterwards changed into Mexitli, and finally into México.

Here the Aztecs constituted their first government, which was theocratic and military, under Tenoch, who died in the year 1343. Three years subsequent to his death the form of government changed, and

in 1376 the first king was elected. Ten kings followed, during the reign of which the Aztecs devoted themselves to the arts of peace and built a fine city, connecting it with the mainland by four causeways. The last of the Aztec monarchs was Cuauhtemoc, whose conquest by Hernando Cortés brought an end to the Mexican dynasty.

Cortés landed on the island of San Juan de Ulua, in Veracruz Harbor on the 21st day of April, 1519, and in two years, August 13, 1521, had captured the City of México and unfurled the flag of Spain over the palace of Moctezuma.

Under the name of New Spain, México was ruled from 1521 to 1821 successively by five governors, two royal commissioners (*audiencias*), and sixty-two viceroys, the last of whom, Juan O'Donojú, did not assume control.

During the administration of the first viceroy, Don Antonio de Mendoza, who ruled from 1535 to 1550, discoveries were actively prosecuted in the north, the first money was coined in México, the University of México and several colleges were founded, and the first printing press in the New World was introduced. The School of Mines, which is still standing, and yearly graduating talented men, was founded by the viceroy the Marquis of Branciforte. The construction was begun in 1797, and the building was completed in 1813. Its total cost was about \$2,000,000.

The modern history of México and the commencement of the almost continuous internecine wars may be said to date from the "grito de Dolores" on the night of the 16th of September, 1810, by the parish priest of Dolores, Don Miguel Hidalgo y Costilla, who gathered about him many trusty followers under his banner to the cry of: "Long live religion! Long live our Most Holy Mother of Guadalupe! Long live America, and death to bad government!" This cry is what is known as "el grito de Dolores."

Several efforts to cause a rebellion against the Spanish authorities had been made previous to this date, in fact ever since 1798, during the incumbency of the forty-fifth viceroy, Miguel José de Azanza, but they were all suppressed.

Hidalgo marshaled a considerable force and was victorious in several engagements, but he and his lieutenants—Allende, Aldama, and Jimenez—were captured and put to death in 1811, the first on the 31st of July and the three last-named on June 26. The bullets that crashed through these patriotic breasts terminated the first stage of the war for independence.

One of the greatest figures in Mexican history then came to the front, José María Morelos y Pavón, the parish priest of Carácuaro, who by his audacity, valor, and military sagacity was accorded a position at the head of the leaders of the cause of independence. After many notable engagements, in which he was almost always victorious,

he captured Acapulco on April 12, 1813, thus ending his second campaign. On the 14th of September, 1813, in the town of Chilpancingo, the first Mexican Congress was installed, which two months later (November 6) issued the declaration of independence and decreed the emancipation of the slaves. The first provisional constitution was adopted October 22, 1814.

Morelos was eventually overcome by being betrayed by a deserter from his ranks named Carranco, was taken to México, tried, and sentenced to be shot. The sentence was carried out at San Cristobal Ecatepec on the 22d of December, 1815.

But the cause of independence was still sustained by many leaders in different parts of the Republic, among them being Francisco Javier Mina, a Spanish officer, who resolved to do battle for the independence of México. He disembarked at the port of Soto la Marina on April 15, 1817, with 500 men recruited in the United States, and marched rapidly into the interior, gaining many victories. He was apprehended at the ranch called Venadito, and was shot the 11th of November, 1817. Many other patriot chiefs arose to lead the independent movement, but most of them met the fate of their predecessors. Among these was Guerrero, who, after many hazardous exploits and brilliant achievements, finally, on the 10th of January, 1821, held a conference with Agustín de Yturvide, brigadier-general in command of the royalist forces, at Yturvide's request, and the two leaders agreed to proclaim independence. The latter proclaimed what is known as "The Plan of Iguala," on February 24, 1821.

Yturvide, then assuming command of the forces, marched on México, making Valladolid (now Morelia), Querétaro, and Puebla capitulate on the way. On reaching México the Viceroy Apodaca was deposed July 5, 1821.

The sixty-second and last viceroy, Juan O'Donojú, arrived at Veracruz on the 30th of July, and, upon hearing of the condition of affairs, issued a proclamation and entered into communication with the independents. Yturvide went to Córdoba, where a conference was held, resulting in the treaty of Córdoba, which, with slight modifications, confirmed the plan of Iguala, and Spanish domination in México, which had lasted three hundred years, closed forever when, on the 27th of September, 1821, Yturvide made his triumphal entry into the capital.

The second Mexican Congress, the first after securing independence, met on February 24, 1822, and elected Yturvide Emperor on the 19th of May of the same year. He was crowned and anointed with great pomp and ceremony in the great cathedral of the capital on the 21st of June following as Agustín I, Emperor of México. His reign was short. The people who had been warring so long could not settle down to peaceful pursuits. Ambitious leaders thirsted for high places,

and the smoke of the battles for independence had scarce lifted before General Santa-Anna headed a revolutionary movement in Veraacruz, proclaimed a republican form of government, and compelled Yturbide to abdicate and leave the country. He became desirous to revisit it, and, returning to México, was arrested immediately upon disembarking, taken to Padilla, brought before the legislature of Tamaulipas in session there, and by that body condemned to death. He was shot July 19, 1824, just five days after landing.

The Federal Republic was established on the ruins of the Empire. The third Mexican Congress assembled November 7, 1823, and proclaimed on October 4, 1824, a republican constitution, which was patterned closely upon that of the United States. The first President of México, the patriot Gen. Guadalupe Victoria, took the oath of office on October 10. Congress was dissolved December 24, 1824, and the first constitutional Congress convened January 1, 1825. During this year England and the United States formally recognized Mexico.

Independence being secured, two parties came into existence—the Spanish, which became the Centralists, and the Republicans, who became Federalists. To this division is due the constant internal disturbances and agitations in México from 1828 to 1846. During this period five radical organic changes swayed the people between centralism and federation.

The two parties succeeded each other in power, mostly through revolutions, until 1847, when the war with the United States, which had commenced the year previous, ended and the latter nation acquired more than two-fifths of the Mexican territory. After the declaration of peace between the two countries the Mexican Liberal party remained in power (except from 1853 to 1855, when General Santa-Anna governed as Dictator), carrying out its theories of government. In the year 1857 the Constitution now in force in México was framed by a constitutional assembly.

In 1861 England, Spain, and France formed an alliance to declare war against México, but the alliance had been scarcely perfected when the two first-named powers withdrew and France was left alone in the enterprise. War between the two nations lasted from 1862 until 1867 without the French gaining any decided foothold.

Possessing themselves finally of the capital, they established an empire, aided by a number of disaffected Mexicans, and placed the crown upon Maximilian of Hapsburg, Archduke of Austria.

The Archduke arrived in the city of México on June 12, 1864, accompanied by his wife, Carlota, daughter of Leopold I, King of the Belgians. These two unfortunate beings were crowned Emperor and Empress of México with great solemnity in the cathedral and ruled a portion of the country until 1867, when the perfidy of Bazaine and the cowardice of Napoleon III destroyed the life of Maximilian and the reason of Carlota.

Maximilian, bereft of the aid and protection of the French, intrenched himself in Querétaro, where he was made prisoner by the Republicans and shot, together with the Imperialist Generals Miramón and Mexía, at the Cerro de las Campanas, the 19th of June, 1867.

Benito Juárez, of Indian birth, and possessed of great ability, patriotism, and energy, was the President of the Republic during the turbulent times of the reformation and the war with France. He entered the capital victorious on the 15th of July, 1867, and retained the Presidency until his death, in 1872, being the only Mexican who has died during an occupancy of that office. His immediate successor was Sebastián Lerdo de Tejada, who retained the office until 1876, when he was unseated by the revolution of Palo Blanco. Gen. Porfirio Díaz succeeded Lerdo de Tejada in May, 1877, and was followed by Gen. Manuel Gonzalez in 1880. In 1884 General Díaz was elected to a second term, and has since continued at the head of the Government. His administration has been attended with great progress and prosperity.

The governments of México since the securing of independence have been as follows:

Regencies.—(1) Composed of Generalísimo Don Agustín de Yturvide, Don Juan O'Donojú, Don Manuel de la Bárcena, Don Isidro Yañez, and Don Manuel Velasquez de León, 1821 to 1822. (2) Don Agustín de Yturvide, Don Isidro Yañez, Don Miguel Valentín, Count de Casa de Heras, and Brig. Gen. Don Nicolás Bravo, 1822.

Empire.—Yturvide, with the title of Agustín I, 1822 to 1823.

Provisional Governments.—The council charged with the supreme executive power, composed of Don Nicolás Bravo, Don Guadalupe Victoria, and Don Pedro Negrete, with Don José María Michelena and Don Miguel Dominguez as substitutes, 1823 to 1824.

Federal Republic.—Gen. Guadalupe Victoria, 1823 to 1829; Gen. Vicente Guerrero, 1829; Don José María Bocanegra, 1829; Don Pedro Velez, President of the Supreme Court of Justice, Gen. Luis Quintanar and Don Lucas Alamán, 1829; Gen. Anastacio Bustamante, 1830 to 1832; Gen. Melchor Musquí, 1832; Gen. Manuel Gomez Pedraza, 1832 to 1833; Don Valentín Gomez Farías, 1833; Gen. Antonio Lopez de Santa-Anna, 1833; Don Valentín Gomez Farías, 1833 to 1834; Gen. Antonio Lopez de Santa-Anna, 1834 to 1835; Gen. Miguel Barragán, 1835 to 1836; Don José Justo Corro, 1836 to 1837.

Central Republic.—Gen. Anastacio Bustamante, 1837 to 1839; Gen. Antonio Lopez de Santa-Anna (substitute), 1839; Gen. Nicolás Bravo (substitute), 1839; Gen. Anastacio Bustamante, 1839 to 1841; Don Javier Echeverría, 1841.

Dictatorships.—Gen. Antonio Lopez de Santa-Anna, 1841 to 1842; Gen. Nicolás Bravo, 1842 to 1843; Gen. Antonio Lopez de Santa-Anna, 1843; Gen. Valentín Canalizo, 1843 to 1844.

Central Republic.—Gen. Antonio Lopez de Santa-Anna, 1844; Gen. Valentín Canalizo, 1844; Gen. José Ignacio Herrera, 1844 to 1845; Gen. Mariano Paredes y Arrillaga, 1846; Gen. Nicolás Bravo, 1846.

Federal Republic.—Gen. Mariano Salas, 1846; Don Valentín Gomez Farías, 1846 to 1847; Gen. Antonio Lopez de Santa-Anna, 1847; Gen. Pedro María Anaya, 1847; Gen. Antonio Lopez de Santa-Anna, 1847; Don Manuel de la Peña y Peña, President of the Supreme Court of Justice, 1847; Gen. Pedro María Anaya, 1847 to 1848; Don Manuel de la Peña y Peña, 1848; Gen. José Joaquín de Herrera, 1848 to 1851; Gen. Mariano Arista, 1851 to 1853; Don Juan B. Ceballos, President Supreme Court of Justice, 1853.

Dictatorships.—Gen. Manuel María Lombardini, 1853; Gen. Antonio Lopez de Santa-Anna, 1853 to 1855; Gen. Rómulo Díaz de la Vega, 1855; Gen. Martín Carrera, 1855; Gen. Juan Alvarez, 1855; Gen. Ignacio Comonfort, 1855 to 1857.

Constitutional Presidents.—Gen. Ignacio Comonfort, 1857 to 1858; Don Benito Juárez, President of the Supreme Court of Justice, 1858 to 1861. Don Benito Juárez (elected), 1861 to 1872; Don Sebastián Lerdo de Tejada, President of the Supreme Court of Justice, 1872; Don Sebastián Lerdo de Tejada (elected), 1872 to 1876; Gen. Porfirio Díaz (provisional), 1876; Gen. Juan N. Mendez (substitute), 1876; Gen. Porfirio Díaz (elected), 1877 to 1880; Gen. Manuel Gonzalez, 1880 to 1884; Gen. Porfirio Díaz, 1884 to 1888; Gen. Porfirio Díaz, 1888 (still in office, serving fourth consecutive term).

During the years from 1857 to 1860, in the capital of the Republic, which at the time was in the power of the Conservative party, there governed in the capacity of Presidents the following persons:

Gen. Felix Zuloaga, 1857; Gen. Manuel Robles Pezuela, 1858; Don José Ignacio Pavón, 1858; Gen. Miguel Miramón, 1858; Gen. Felix Zuloaga, 1859; Gen. Miguel Miramón, 1859 to 1861.

As a result of the French intervention, the Imperial Government was established from 1864 to 1867.

While awaiting the arrival of the Archduke Maximilian of Austria, Bishop Juan B. Ormachea and Generals Juan N. Almonte and Mariano Salas governed as regents.

CHAPTER III.

ETHNOLOGY AND ARCHÆOLOGY OF MÉXICO.

By OTIS T. MASON,

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No attempt is here made to resolve into its constituent ethnic elements that remarkably composite people which first set eyes on Yucatán in 1517. Suffice it to say that Iberian, Semite, Hamite, Goth and Vandal, Roman and Celt had mingled their blood in that stream of brave and adventurous men. From remotest time Spain had been the meeting ground of races, of peoples, of languages, and of religions. One does not know which to admire more—the brilliant recklessness of the soldier or the fiery zeal of the priest. The Mexican of to-day has the blood of more races in his veins than any other American, and as the present Indian population is largely metis, what a compound of races! “No other portion of the globe,” says H. H. Bancroft (1874, ii, 87), “embraces within equal latitudinal limits so great a variety of climate and vegetation as México.” It is also true that within the area of the original territory there were more families of native languages than in all the Western Hemisphere besides; and, to complete the chain, there were more kinds and grades of culture there. The Seri Indians, of Sonora, are as abject as the Fuegians, while the Nahuatl and Maya speaking tribes of the valley of México and of Yucatán occupied the most elevated position for culture in the New World.

The origin of the Mexican aborigines is involved in that of the American Indians, since within the present boundaries of that Republic are gathered representatives of every zone, from the Apache, an Athapascan, whose principal home is in Alaska, to the tribes of Oaxaca and Chiapas, who are the children of a torrid clime. There are now in México ten times more Indians than were ever at any time within the United States domain. In the works of Orozco y Berra (1864), Pimentel (1862), and Alfonso L. Herrera (1895) the reader will find complete lists of all tribal names. These include, often, several titles for the same tribe, to wit, their own name, by which they call themselves; their place name, as we now mark persons by the town where they live; names, often of contempt, by which a tribe is designated among its neighbors, besides titles conferred through mis-

take by ignorant observers. From among all these bewildering designations the following are selected. The linguistic families are marked by the termination -an, after the example of the Bureau of American Ethnology. In assigning tribes to their stocks frequent references are made to Brinton (1891) and Gatschet (1885). The last-mentioned authority has given most personal study to the Nahuatlán family since Buschman (1859).

Mention must also be made of the linguistic map in Cubas (1876) and to Keane (1878). In the table the family names of Pimentel appear in the order followed by that author. On the right is given the abbreviated form here adopted. The numbers in the margin are Pimentel's. Following this list of families another will be found, in which the states of the Republic wherein the families chiefly reside accompany the name of each. It is quite possible that these may need emendation, but the information here given is the best at hand.

Linguistic families in México.

Pimentel's list (1862).	Author's list (1900).	Census in 1895.
Mexicana	Nahuatlán	1,750,000
Sonorense Opata-Pima	Piman	85,000
Guaicúra (a) y Cochimi-Laimon	Yuman	2,500
Seri	Serian	200
Tarasca	Tarascan	250,000
Zoque-Mixe	Zoquean	60,000
Totonac	Totonacan	90,000
Mixteco-Zapoteca	Zapotecan	580,000
Matlalzinga o Pirinda	Otomian (not certain)	5,000
Maya-Quiché	Mayan	400,000
Chontal (not a family name)	Tequistlatecan (?)	31,000
Huave	Huavan	3,800
Apache	Athapascan	8,000
Othomiés	Otomian	704,734
Total .....	.....	63,970,234

^a Guaicúra may be a separate family.

^b These numbers are not accurate, but serve for comparison.

LOCATION OF MEXICAN LINGUISTIC FAMILIES.

Nahuatlán or Mexican family.—Aguascalientes, Colima, Federal District, Guerrero, Hidalgo, Jalisco, México, Michoacán, Morelos, Oaxaca, Puebla, Sinaloa, Tabasco, Tlaxcala, Veracruz.

Piman family.—Made a subfamily of Nahuatlán by Buschmann (1859), Gatschet (1879), and Brinton (1891); Chihuahua, Durango, Jalisco, Sinaloa, Sonora, Zacatecas.

Yuman family.—Northern part of Lower California.

Serian family.—Sonora, Tiburón Island.

Tarascan family.—Michoacán, a few in Guerrero and Jalisco.

Zoquean family.—Oaxaca, chiefly; also Guerrero and Puebla.

Totonacan family.—Northern part of Puebla and Veracruz.

Zapotecan family.—Chiefly in Oaxaca; also in Guerrero and Puebla.

Mayan family.—Yucatán, Chiapas, and Veracruz.

Tequistlatecan family.—Oaxaca (Brinton, 1891, p. 148).

Huaran family.—Chiapas.

Athapascan family.—Chihuahua and Sonora. Apache intruders from United States.

Otomian family.—Guanajuato, Hidalgo, Querétaro, San Luis Potosí, Michoacán. The Chontals of Oaxaca and Guerrero are placed by Brinton in a provisional family, which he names Tequistlatecan, and puts the Triquis in the same. The Chontals of Tobasco are Mayan (1891, p. 146). Matlalzinca may be a family. Not in Pimentel's list are the Chinantecan family, in Oaxaca; the Chiapanecan family, in Chiapas, and a remnant of the Tañoan family, in Chihuahua.

A glance at the table of linguistic families shows their relative importance. The census is from Herrera (1895), and may be defective, but is correct enough to exhibit the relative importance of these families in the past and present history of México. Those that were, in fact, the predominant factors in that culture were, proceeding southward from the boundary line of the United States, as follows:

Piman, the Opata-Pima of the later Mexican authorities, occupy the western northern States as far south as Guadalajara, lying along the Gulf of California, except where they are cut off by the Seri, but they do not anywhere approach the ocean, being intercepted by the Nahuatlán tribes. Eminent authorities, among them Buschmann (1854), Gatschet (1876), and Brinton hold the Piman to be a branch of the Nahuatlán family, including the Shoshonean in the United States (Powell, 1891, p. 108), the Sonoran or Opata-Pima (Brinton, 1891), and the Nahuatl or southern branch. This stock now occupies the site of the Casas Grandes and other adobe ruins, and it is reasonable to suppose that their ancestors were the builders and inhabitants of many ancient pueblos and cliff sites, both in Arizona and northern México. (Baudelier, 1890.)

Nahuatlán.—Following the Bureau of American Ethnology in keeping the Piman as a separate family leaves the Nahuatlán free to include only Pimentel's Mexicana. The tribes of this stock are found in almost unbroken continuity from Sinaloa along the Pacific slope to the border line of Guatemala. In the valley of México they occupied three districts, Tezcuco, Tlacopán, and Tenochtitlán. This family holds the most prominent position in the history of the Conquest. (Thomas, 1898, 233; Bancroft, 1875, ii, 133; Cubas, 1876.)

Otomian, a widely spoken language formerly. The tribes were among the earliest in the valley of México, and they spread themselves out over Guanajuato, Hidalgo, Querétaro, San Luis, and Michoacán.

Tarascan, inhabitants of Michoacán. The Tarascos were builders in stone, metal workers, and most excellent weavers. (Leon, 1874.)

Totonacan, of Veracruz, the first natives encountered by Cortés. (Thomas, 1898, 332.)

Zapotecan, the Mixteco-Zapoteca, of Pimentel, are in Oaxaca and Guerrero. The ruins of Mitla are within their territory, with their wonderful artificial hills, stone buildings, fretworks in cut stones, columns, and wall paintings. (Holmes, 1897, 227, quoting Charnay & Bandelier.)

Zoquean, Zoque-Mixe family are in Chiapas, Oaxaca, and Tabasco, between the Mayan and the Zapotecan tribes. Little is known of their origin, save a tradition of their having come from the South. If their ancestors were ever possessed by the spirit of culture progress, once so exalted here, the pride of former days now sleeps "as though that soul were dead."

Mayan family, the advance guard of new world progress. Scholars have consecrated their lives worthily to the Maya civilization. After Bancroft (75, ii, 630-805), consult Holmes (1895, pt. i), Brinton (91, 153-159, with notes), Thomas (1899), Seler (1887), Maudslay (1897), Förstemann (1890), Gunckel (1897).

The Mayas, excepting a colony of Huastecas, on the Rio Panuco, in Veraacruz, lived together in Yucatán, Guatemala, and Honduras (Stoll, 1884, 180 pp.). To them may be assigned the wonderful ruins of Palenque in Chiapas, of Copán, in Honduras, of Uxmal and Chichen-Itza, in Yucatán.

The following tribal names have been selected out of the many hundreds of designations before mentioned, because it seemed possible to assign these to their linguistic families and locations. The list will at least form a working basis for future inclusions and exclusions:

ABORIGINAL TRIBES IN THE REPUBLIC OF MÉXICO, TOGETHER WITH THEIR LINGUISTIC
FAMILIES AND LOCALITIES.

- Acaxeas (Nahuatlan F.), Sinaloa, Durango.
- Axotecas (Nahuatlan F.), México, ancient division of Chichimecs.
- Acolhuas (Nahuatlan F.), México, ancient ruling tribe, Colhuas.
- Agualulco (Nahuatlan F.), Tabasco, also Ahualulco.
- Ahomaos (Piman F.), Sinaloa, also Ahomes.
- Aicales (Mayan F.), Chiapas, dialect of Chol., see Mopanes.
- Ajoyes (Mayan F.) Chiapas, dialect of Chol., also Axoyes.
- Alames (Mayan F.), Chiapas.
- Alasapa (Coahuiltecan F.), Coahuila, N. Leon.
- Amuchgos (Zapotecan F.), Guerrero, also Anusgos.
- Apache (Athapascan F.), Northern boundary; the Apaches of Yuma affinity are all in the United States.
- Aripas (Yuman F.), lower California, branch of Waikuru.
- Ateacaris (Nahuatlan F.), Jalisco, Cora proper.
- Aztecas (Nahuatlan F.), Mexicans of Anahuac. Seven tribes came from Aztlan in the north, and the Aztecas were one of them. They arrived in the following order: Sochomilcos, Chalcas, Tepanecos, Tescucans, Tlatlnicans, Tlascalans, Mexicans, or Aztecas.
- Babiocora (Piman F.), branch of Teguinia, Teguis.
- Basirora (Piman F.), Sonora, Sinaloa.

- Batucari (Piman F.) Sinaloa.
 Batucos (Piman F.), Sonora, division of Teguis.
 Benixonos (Zapotecan F.), same as Cahoncos or Nexicha.
 Biara (Piman F.), Sinaloa, dialect of Tehues.
 Cahita (Piman F.), Sonora, Sinaloa, include Yaquis, Mayos, Tehuecos, Zuaques.
 Cajonos (Zapotecan F.), same as Benixonos.
 Cátuxanos (Coahuiltecan F.), Coah., Tam., also Catuxanos.
 Ceris, same as Seris.
 Coahuiltecan Family, Texas and N. E. México; also Texan.
 Coahuiltecos (Coahuiltecan F.), Coahuila.
 Cochimis (Yuman F.), north and middle California peninsula.
 Cocomaricopas (Yuman F.), Maricopas, Pima agency, Ariz.
 Cocomes (Mayan F.), said to be in Yucatán.
 Cocopas (Yuman F.), both sides of Colorado mouth; river and mountain tribes.
 Coguinaches (Piman F.), Sonora, division of Opata.
 Cohuixcas (Nahuatlan F.), Guerrero.
 Colotlans (Nahuatlan F.), name of country for Coras, Zac., Jalisco.
 Comanche (Shoshonean F.), northern border of Mex., now in Oklahoma.
 Comitecos (Mayan F.), Chiapas; Chañabal of Comitán.
 Comecrudos (Coahuiltecan F.), Tamaulipas, wrongly Carrizos.
 Comeyas (Yuman F.), southern California, probably Diegueños.
 Comoporis (Piman F.), Sinaloa.
 Comoyei (Yuman F.), between Colorado River and ocean; Comeya, Quemaya.
 Comuripas (Piman F.), Sonora.
 Conchos (Yuman F.), California, branch of Guaicuru.
 Conchos (Coahuiltecan F.), Chihuahua.
 Corarus (Nahuatlan F.), Jalisco.
 Coras (Nahuatlan F.), Jalisco, in Sierra del Nayarit.
 Coras (Yuman F.), Lower California.
 Cotoname (Coahuiltecan F.), Tamaulipas.
 Coviscos (Zoquean F.), Puebla, Cahuixcas, dialect of Mixe (Brinton).
 Coyoteris (Athapascan F.), northern boundary; now Arizona.
 Cuchan (Yuman F.), Yuman proper, in Arizona and California, south part of State.
 Cuicatecos (Zapotecan F.), Oaxaca.
 Cuitlatecos (Nahuatlan F.), Guerrero, Michoacan, Tecos; also Popolocas.
 Culuas (Nahuatlan F.), México; Colhuas, identified with Tezcucans.
 Chalcas (Nahuatlan F.), México, also Chalcotecanos; around the lake of Chalco, "where sand is."
 Chalqueños (Nahuatlan F.), México; same as Chalcas.
 Chamules (Mayan F.), Chiapas, are Tzentel.
 Chañabales (Mayan F.), Chiapas; Comiteco, Jocolabal.
 Changuaguanes (Athapascan F.), Chihuahua.
 Chapaneos (Chiapanecan F.), Chiapas, Mangles in Nicaragua.
 Charaecos (Otomian F.), Michoacán; Pirindas.
 Charenses (Otomian F.), Michoacán; Pirindas.
 Chatinos (Zapotecan F.), Oaxaca and Chiapas.
 Chayopinos (Coahuiltecan F.), Coahuila.
 Cheles (Mayan F.), Yucatán.
 Chiapanecan family, with remnants in Chiapas.
 Chichimecos, ancient tribe of México, not a family; Brinton, 1894, 129; some were Nahuatlan, some Otomian.
 Chilpaines (Athapascan F.), Coahuila.
 Chimalapas (Zoquean F.), Tehuantepec.
 Chimalpanecs (Nahuatlan F.), ward of Tezcuco.

- Chinantecan family, Oaxaca; Tenez, Teutecas, Tzinantecos; Brinton, 1894, 144, 158.
- Chinarras (Nahuatlán F.), Chihuahua; Humas.
- Chinipa (Piman F.), Chih., div. of Tarahumara; see Varogio.
- Chinquímes (Zoquean F.), Puebla, Guerrero, Tlapanecos, possibly the ancient Niximes.
- Chochona (Zapotecan F.), Oaxaca. Put also with Tlapaneco.
- Choles (Mayan F.), Chiapas.
- Chorotegas (Chiapanecan F.), or Cholultecas; Nicaragua.
- Chuchones (Zapotecan F.), Oaxaca, Guerrero.
- Cuitlatecos (Nahuatlán F.), tribe of Mexicans, "dunghill people."
- Chontals, non-Nahuatl tribes; the word means "outcasts;" Brinton, 1894, *s. v.*
- Chontals (Mayan F.), Tabasco; identified with Tzentel.
- Chontals (Tequistlatecan F.), Oaxaca; Brinton; Belmar makes them Zapotecan.
- Dohmes (Piman F.), Sonora, Dohemabatuco; see Eudeve; is probably a local name.
- Eudeves (Piman F.), Sonora; branch of Opatas.
- Guaicuru (Yuman F.), Lower California; may be a separate family (Gatschet).
- Guailepos (Piman F.), Chihuahua; see Chinipas.
- Guaymas (Piman F.), Sonora.
- Guazapari (Nahuatlán F.), Chihuahua.
- Heve (Piman F.), Sonora; see Doheme, Eudeve.
- Hielucios (Piman F.), Sinaloa, dial. of Tehuaco.
- Himeris (Piman F.), Sonora.
- Hizos (Piman F.), Chihuahua.
- Huastecas (Mayan F.), Veracruz; Huastec.
- Huavan family, Tehuantepec; also written Huavi, Wabi.
- Huazontecos (Huavan F.), Tehuantepec.
- Huicholes (Nahuatlán F.), Zacatecas, Jalisco.
- Huites (Nahuatlán F.), Sinaloa.
- Humas (Nahuatlán F.), Chihuahua; Chinarras.
- Humes (Nahuatlán F.), Durango; Hiumi (Latham), Acaxé.
- Husorones (Piman F.), Chihuahua, dial. of Tarahumara.
- Ipapanes (Totonacan F.). Keane puts with Huastec.
- Itza (Mayan F.), Yucatán, Chichen-Itza; Itzalanos.
- Jaripecha (Tarascan F.), Guanajuato.
- Jocolabal (Mayan F.), Chiapas; Chañabal.
- Jonaz (Otomian F.), Guanajuato, Querétaro.
- Jopes (Zoquean F.), Chiapas; Tlapanecos, Yopes.
- Jovas (Piman F.), Sonora; Jobas, Ovas, dial. of Opata, perhaps the same as the Eudeves or Heves.
- Juaves, same as Huave, Huavan family.
- Kupules (Mayan F.), Yucatán.
- Kutchan (Yuman F.), Lower Colorado River; Ko-Utchan, Cutganes.
- Lacandones (Mayan F.), Chiapas, not a language (Berendt).
- Laimonos (Yuman F.), Cal. peninsula, with Cochimi.
- Matapanes (Piman F.), Sinaloa.
- Matlalcincos, or Matlalcingas, Nahuatl name for Pirinida. May be a family (Saville.)
- Matlames, same as Matlalcincos, with ending-tzin removed.
- Maya (Mayan F.), Yucatán, Tabasco, and Chiapas.
- Mayan family. All over southeastern México.
- Mayos (Piman F.), Sonora, subtribe of Cahita.
- Mazahua (Otomian F.), southwestern part of valley of México; Michoacano.
- Mazapil (Nahuatlán F.), Zacatecas.

- Mecos (Otomian F.), Zacatecas; see Jonaz, Serrano. Mecos seems abbreviation of a longer tribal name, as with Teco, Tecos.
- Mazatecos (Zapotecan F.), Oaxaca; anct. Mazatlán.
- Mecos (Otomian F.), Guxanajuato; see Jonaz.
- Mexicanos (Nahuatlan F.). The southern Nahuatlan tribes, so called.
- Meztitlatecas (Nahuatlan F.), México.
- Michoas (Tarascan F.), Michoacán.
- Mijes (Zoquean F.), Oaxaca; also Mixes.
- Minbreños (Athapaskan), Sonora, or Arizona.
- Mixtecos (Zapotecan F.), Oax., Pueb., Guer., Miztoguijxi.
- Monquies (Yuman F.). See Waicuru.
- Mopanes (Mayan F.), Chiapas, are Choles. This problematic tribe probably speaks Maya.
- Muutzizti (Piman F.), Jalisco, branch of Cora, Muutzicat.
- Nahuatl and Nahua, instead of Aztec or Mexican, the "national" designation; divided into northern, or Piman (Sonoran), and southern, or Mexican (Gatschet).
- Nahuatlan family includes all so-called Uto-Aztecan tribes in México.
- Naolingos (Totonacan F.), Veracruz, Puebla.
- Nayaritos (Nahuan F.), same as Coras.
- Nevomes (Piman F.), Sonora.
- Netzichos (Zapotecan F.), Oaxaca; also Nexitzas.
- Niquíran (Nahuatlan F.), México.
- Ocotlanos (Zapotecan F.), Oaxaca.
- Olmecas, preceded fabled Toltecs in México. Language unknown.
- Onavas (Piman F.), Sonora, branch of Opatas. The name means "salt."
- Oyata (Piman F.), Sonora, Rio Yaqui.
- Otomi (Otomian F.), Middle States, many spellings. México, Veracruz, Pueblo, Tlaxcala, Querétaro, Guanajuato, San Luis, Michoacán.
- Pacheras (Piman F.), Chihuahua, branch of Tarahumara.
- Pames (Otomian F.), México, Querétaro, Guanajuato, Nuevo Leon, San Luis.
- Pantecos (Mayan F.), Veracruz, are Huastecs.
- Papagos (Piman F.), Sonora, some in Arizona (southern).
- Pauzanes (Coahuiltecan F.), Coahuila.
- Pericúes (Yuman F.), Lower California.
- Pihiques (Coahuiltecan F.), Coahuila, México.
- Pimas (Piman F.), Sonora; P. Altos and P. Bajos.
- Pinomes (Zoquean F.), Tabasco, Oaxaca, Chiapas; Tlapanecos.
- Pirindas (Otomian F.), Michoacán, México; same as Matlaltzincas; pirinti means "interior (tribe)" in Matlaltz language. May be a family.
- Piros (Tañoan F.), Chihuahua.
- Popolucas, non-Nahuatl tribes of southern México.
- Popolucas of Oaxaca, are Zapotecan.
- Popolucas of Puebla, are Zoquean; the popolucas of southern Guatemala also speak Mixé (a Zoquean dialect).
- Potlapiguas (Piman F.), Sonora, dialect of Pima.
- Putum (Mayan F.), Chiapas, wrongly Punctunc; see Chol.
- Sabaibos (Nahuatlan F.), Sinaloa, Durango; see Acaxeas.
- Sabaquis (Piman F.); same as Sobaipuris.
- Saharipas (Piman F.), Sonora.
- Seris (Yuman F.), Sonora; same as Ceris.
- Serranos (Otomian F.), Tamaulipas, probably.
- Sinaloas (Piman F.), Sinaloa; see Cahitas.
- Sobaipuris (Piman F.), Sonora.
- Sochimilcos (Nahuatlan F.), first of seven original Mexican cave-dwelling tribes.

- Soltecos (Zapotecan F.), Oaxaca.
 Sonoras (Piman F.), Sonora; Opatas.
 Supis (Yuman F.), Chihuahua. The Hava sú-Pai, also of Arizona. These are Yuman.
 Tañoan family, on the Rio Grande and its tributaries. (Bivell.)
 Tantoyoc (Mayan F.), dialect of Huastec.
 Tapanecos (Nahuatlán F.), original Mexican tribe.
 Tapijulapanes (Zoquean F.), Tehuantepec.
 Tarahumaras (Piman F.), Chihuahua.
 Tarascos (Tarascan F.), Michoacán; also Guerrero, Guanajuato, Jalisco.
 Tarelepa (Mayan F.), southern México.
 Tatimoles (Totonacan F.), Veracruz.
 Teacualitzistis (Nahuatlán F.), branch of Cora del Nayarit.
 Teatas (Piman F.) Sonora; also Tehatas.
 Tebasas (Nahuatlán F.), branch of Acaxeas.
 Tecojines (Zoquean F.) Jalisco, Tlapanecos.
 Tecoripas (Piman F.), Sonora.
 Tecos (Nahuatlán F.), Michoacán, for Cuitlatecos.
 Tecnalmes (Piman F.?), Jalisco; see Coras.
 Teguinias (Piman F.), Sonora; Opatas, Teguis.
 Tehua (Tañoan F.), near El Paso de Texas.
 Tehuecos (Piman F.), Sinaloa, dial. of Cahita.
 Tejanos, same as Coahuiltecan, Texasos.
 Tektikilhatís (Totonacan F.), Veracruz.
 Tenimes (Zoquean F.), Puebla; see Yopes.
 Teotenancas, first Chichimecs in valley of México.
 Tepancecos, third Nahuatl tribe to arrive in México and one of three confederated tribes at time of conquest; capital, Tlatopan.
 Tepeguana (Piman F.), Durango, Buschman's Aztec-Sonora.
 Tepozcolula (Zapotecan F.), Oaxaca, dialect of Mixtec.
 Tequis (Piman F.), Division of Opatas.
 Tequistlatecan family, in Oaxaca, see Chontal, Triquis.
 Texasos (Coahuiltecan F.), Texas and N. E. Mex., family name.
 Texones (Coahuiltecan F.), Tamaul, "raccoons," also Tejones, dialect of Pakawa (Gatschet), "tattooed," same as Coahuiltecan.
 Tewan, see Tañoan family.
 Tezucos (Nahuatlán F.), Mex., see Acolhuas, fourth Nahuatlán tribe to arrive in Anahuac.
 Tlacopán, now Tacuba, suburb of the City of México.
 Tlahuicos (Nahuatlán F.), one of seven original Mexican tribes.
 Tlapanec (Zapotecan F.), Guerrero (dialect of Mixe, according to Brinton).
 Tlascalans (Nahuatlán F.), sixth in order of seven orig. Mex. tribes.
 Tlatluicans (Nahuatlán F.), fifth Nahuatlán tribe in Anahuac.
 Toltecas, people of Tula, on Toltecs, Brinton, '94:129; Thomas, '99:235.
 Tontos (Yuman F.), Sonora, now in Arizona.
 Totonacos (Totonacan F.), Veracruz, first natives seen by Cortés.
 Triquis (Zapotecan F.), according to Belmar; Tequistlatecan F., Brinton, Oax.
 Tzentalis (Mayan F.), Tabasco and Chiapas, many spellings.
 Tzotzils (Mayan F.), Chiapas, dialect of Quelene.
 Uchitas (Yuman F.), branch of Waikuru.
 Varogios (Piman F.), Chih., br. of Tarahumara.
 Vebetlateca (Mayan F.), Chiapas, the orthography of Don Palacio, xvi. century.
 Xicalancas, preceded Toltecs in valley of México. Valentini thought they were Mayas.

Xicayan (Zapotecan F.), Guerrero and Puebla.
 Xiximes (Nahuatlan F.), classed with Acaxeas.
 Yaquis (Nahuatlan F.), R. Yaqui, Sonora.
 Yavapais (Yuman F.), eight bands, various spelling.
 Yopes (Zoquean F.), Puebla, dialect of Mixe (Brinton).
 Zapotecos (Zapotecan F.), Oaxaca, many tribes.
 Zoquean family, Tabasco, Chiapas, Oaxaca.
 Zuaques (Piman), Sinaloa, branch of Cahita.

These tribes and their ancestors developed their civilization as best they could under the skies and with the natural resources of the country.

In the matter of food, which is the most important consideration of all, the southern Mexicans were happily situated. Since the grade of a people's culture is measured by the amount and variety of artificiality in their daily lives, agriculture is a higher art than fishing or hunting or herding. How fortunate, then, were the Mexicans of old in that their attention was not distracted by the presence of large herds of buffalo or immense schools of fishes. There was in their dietary enough of meat and of fish, but they had the most economic grain in the world—maize—in some places yielding three crops a year. Besides, Mexican soil is congenial to all sorts of pulse, most nitrogenous of plant foods; to cacao; to the banana, most economic of fruits, and to a variety of vegetal productions not known in the temperate zone. There were no plows or agricultural machinery; but there was abundance of water supply and ample means of utilizing it through irrigation canals. Could the ancient régime be restored, an interesting picture would be afforded of premanganic or premechanical thrift. There were farmers in those days such as one might see in busy Japan fifty years ago or yet in many parts of China, where teeming populations are daily fed on ample though not varied fare, the product of human hands alone. The miller—generally the woman—ground the maize on a metate, or slab of lava, with a muller, rather than with a pestle, and cooked her cakes and bread on griddles and in the hot ashes, not differently from the ways of our own ancestors a few generations removed. It was the acme, the apotheosis of the hand epoch, where there were fewer comforts, perhaps, but less misery. (Bancroft, 1875, ii, 242–562.) The serving of food was, like all other activities, conditioned on the social organization. Failing to recognize this, authors have read the most refined aristology into the rude but hearty feasting of the Mexican rulers in ante-Columbian times. For a gorgeous account of Montezuma's dinner the reader may consult Bancroft (1875, ii, 174–178), and as an antidote to this, Morgan (1881, 237–248), the truth doubtless lying somewhere between.

The next anxiety of a people after appeasing hunger is to clothe the body artificially against heat and cold, against rain and drought, and against damage from without. The ancient Mexicans wore sandals,

which, because they had no rawhide for the soles, were woven or plaited ingeniously from vegetable fibers and fastened to the feet differently from the Egyptian type now worn. On the feet of gods and of great persons the sandals are highly decorated. The limbs were bare. Men wore the breech clout and women short kilts or petticoats. The upper part of the body was protected by means of a shawl or robe fastened on the left shoulder, leaving the right hand free. Sleeved garments were not known. The head ordinarily was bare. In the wilder tribes men and women dressed scantily in garments made of skins. The more advanced tribes substituted clothing of bark cloth, like the Hawaiian *tapa*, of nequen fiber, and of cotton. Among the most cultured tribes barbaric splendor was the rule in dress. Every part of the body was decked with jewelry, feather work, and embroidery. Of the priests and persons in authority, as one may see from the codices and sculptures, it may be truly said that Solomon in all his glory was not arrayed like one of these. (Bancroft, 1875, 363-377.)

After clothing comes the habitation. Indeed, a house is a suit of clothing or costume for a family, a clan, a royal establishment, a religious sect. Morgan (1881) holds that the great stone structures of México now in ruins were communal houses, built on the models of those belonging to Indian tribes farther north. In this he is combated by those who look at them after studying the religious edifices of the Orient. No doubt these imposing remains are only a small fragment of what they stand for. As a stone arrowhead picked up on some field was once united to shaft and foreshaft and feathering, and was painted with significant markings, so these stone remains are only insignificant relics of their former selves. Wooden buildings with thatched roofs and with sides plaited into diaper patterns, painted screens, gardens, furniture, and household utensils are all gone. The ancient people lived doubtless very much as the native Mexicans do in our day. Making allowance for intrusions by way of Spain from North Africa and Egypt, and by way of Manila from the Orient, one may be helped greatly in restoring the former times by a study of modern buildings, not forgetting that the clan or gentile system of living prevailed in México as in all other parts of America.

The tools of the ancient stone workers were chiefly of stone. If there were any mason's tools of metal, they were inconsiderable. The Mexican lapidaries could chip, saw, bore, and polish obsidian, nephrite, and other gem stones, and inlay. They were also fond of and skillful in mosaic work, effected by carving masks and other objects in wood or shell, covering the surface with gum and overlaying with scraps of green and other colored stones. (Oppel, 1896, 4.) Excellent examples of this work have been dug from ancient pueblos in Arizona. (Fewkes, 1898, pl. 35.) The ancient Mexican stone masons used the pick, the

bushing hammer, and the abrader, all of stone. They also employed wood for skids, levers, wedges, handles to stone tools, and for burning lime. To these primitive utensils must be added that manual dexterity which comes only through generations of practice and emulation. The tools of fellow-craftsmen were of the same primitive character, and yet with these they also produced astonishing results in wood, shell, gold, silver, and copper.

The Mexican engineer had no helpful beasts of burden, hence his countrymen became famous in the use of their backs, an art not yet passed away. He had the best of ropes, the inclined plane, the lever, the wedge, the parbuckle, and a primitive tackle without pulleys. In certain erections a false core was built up to sustain the masonry, and removed when all was finished. As for his line, plummet, foot-rule, square, and numerical standards, nothing is known; only, if his metric system resembled his calendar, he used a decimal scale.

Among metrical appliances, time measures afford an excellent gauge of a people's progress—to mark definite portions of time, as with the sandglass; to tell the time of day, to note the proper day, furnish materials for the chronograph, the chronometer, and the chronologist.

The more savage tribes of México marked the length of an interval by the fading of leaves set up in the path and the width of the angle traversed by a shadow. Time of day was not registered artificially among the wilder tribes, but in the more cultured there were devices that operated on the principle of the dial. But the calendar of the Nahuatlán, Zapotecan, Totonacan, and Mayan families was quite up to that of the conquerors. The year consisted of three hundred and sixty-five days, in two parts; three hundred and sixty days, divided into eighteen months of twenty days each, and five intercalary days. Each day of the month had a proper name and a graphic symbol. The interpretation of these symbols has taxed the ingenuity of Mexicologists from the beginning. (Thomas, 1898; Seler, 1888).

In this connection, for rating the culture status of the Mexicans must not be overlooked the harnessing of nature's forces for work. The Mexicans, originally, did not use the wind for power unless it may have been to waft the rudest kind of craft and to winnow their harvests. But water was dammed up for agriculture and for fish ponds, floating gardens were known, canals were dug for irrigation and transportation, and, most wonderful of all, in Yucatán were innumerable water caves. The soft, porous limestone, broken up by earthquakes, acted like a sieve for the surface waters, which dissolved for themselves subterranean channels. There are no surface springs, but the roofs of the underground streams, breaking in, formed cistern-like pits, with abundance of water at the bottom. These are approached by trails and ladders, and they have been improved artificially. (Holmes, 1895; Mercer, 1897; Thompson, 1897.)

The woodman was not in evidence to such degree as he became on the north Pacific coast, but all tribes knew the plant world well and within the limits of the Republic there was a great variety of economic species for aliment, drink and medicines, for woods, for fiber. Timber was cut down with stone axes, split with wooden wedges, held together with wooden pegs and lashings. It was shaped roughly with adzes, and there was no lack of tools for creditable wood carving, as the architectural features of that substance bears witness, but drums and furniture were also skillfully carved. The reed lent itself handily to a thousand clever arts.

The textile art was well advanced in México. Its coarsest products were the roofs of the dwellings, their ornamental walls and screens, and fences. Next came matting of reeds, yucca, and palm strips. By varying the plant, the dye, and the pattern, the most pleasing effects were brought about. Articles of dress and utensils of housekeeping without number were plaited from abundant and varied material. Basketry, through failure of tough roots and other material, was not equal to that farther north; but in place of it skillful fingers reveled in feather work, for which nature furnished with lavish hand not only abundant fiber for network, but plumage birds without stint for the gaudy covering.

The Mexican women could spin both with the fingers without mechanical help and by means of spindles, upon the manufacture of which much artistic skill was bestowed. They wove just as the Pima women of Arizona, their kindred, do even to this day, namely, sitting on the ground with warp almost horizontal, one end of it fastened to a stationary object, the other to a belt around their waists. By swaying their bodies they governed the tension. They could do plain weaving, in which the weft of different colors passes back and forth; they could manage diaper effects by counting warp threads at each excursion of the rude shuttle, or they could produce gobelin effects by weaving in the patterns separately. On the surface of these textiles lace work was effected also skillfully. It is an open question, however, whether the beautiful modern drawn work was of native development or imported from Manila in the sixteenth and seventeenth centuries. Tailoring, also, in the modern sense was unknown, garments being made out of the whole piece.

The question whether Mexican aboriginal culture is original or derived has been hotly debated by those who should have known that it is both. The problem of native culture is like those of the geologist and the chemist. In order to ascribe a phenomenon to certain layers or substances, these first exclude foreign intrusions. In the same way those arts which were developed on the soil of México will be more clearly understood by the elimination of intrusions. From the crown of his head to the sole of his foot—literally, from headdress to sandal—

the modern Mexican is Hispano-Egyptian through northern Africa, with an overlapping of the Orient through three hundred years of contact with the Philippines.

There was no potter's wheel, all vessels were being built up by the well-known processes of coiling, modeling, molding, and malleating or beating into shape with paddles. The art of covering with slip, painting, adding ornaments, and burning were well understood, but glazed pottery in ancient México was not known. In the South the ware was far more refined in quality and ornament, that of the central region being overloaded with modeled work. Indeed, in the ware of to-day a school of potters, instead of modeling as the sculptor does, molds the parts of an intricate piece and then lutes them together. Among ceramic treasures are to be noted the musical instruments.

Gold, silver, copper, and perhaps tin were known to the cultured provinces. These metals are still found in the Republic abundantly, but to reconstruct the workshops of the goldsmith or the silversmith is no easy task. Astonishing effects may be produced in these metals, cold or in open fire, in the hands of clever workmen. Those who on a priori ground assert the knowledge of the blowpipe, the bellows, or the knowledge of fluxes do not remember how extremely handy many peoples are without them. Literature concerning the metallurgists, their shops, their tools, their processes, and their handiwork, is most meager. (Peñafiel, 1890.)

In commerce and transportation the apotheosis of human backs and limbs was to be seen in México of old, and in this day they compete successfully against beasts of burden and the iron horse. Mothers bore their children in their garments, the climate being too hot for the cradle board of the North. Passengers were carried on human backs in frames. Loads were packed and held in place both with headbands and breastbands. The commonest picture in some of the paintings is of the burden bearer, and the artist has not despised the carrying strap as a ground for pleasing designs. Runners were common, and relays, so that messages and perishable goods could be delivered quickly. The Mexicans were not skilled on the water. In their almost harborless and riverless country necessity for elaborate water craft did not exist. What little flotation was demanded rafts of reed and logs and dugout canoes supplied. In the more thriving States organized transportation, centers of distribution, and standards of value were established, but the nearest approach to money was in the shape of cacao beans, quills filled with gold dust, and small sheets of copper stamped with simple design. (Bancroft, 1875, 378-399.)

For the communication and record of ideas the tribes of México exhibit an interesting progression. The Sonoran branch of the Nahuatlán family were in this regard Indians pure and simple, with their spoken dialects, gesture speech, telephonic messages, painted

robes, rock carvings, and symbolism. But the Southern families were far beyond that. They had not, forsooth, spelling books and printing presses, but they had gotten as far along as the rudest hieroglyphs of Egypt and Mesopotamia; certainly were as skillful as the Chinese. They had books much like those of eastern Asia, written on parchment or native paper in narrow pages and folded like a Japanese screen, and they engraved their thoughts on stone. The literature of the cultured Mexican tribes—that is, the artistic writing—has nearly all perished, but there was a professional class of scribes, and after the conquest they copied for their rulers many old documents and prepared new ones, some of which remain unto this day. To the decipherment of these and of the intricate calendar system able scholarship has been devoted, and there is room here merely to refer to their researches. (Bancroft, 1875, ii, 508.) Seler says “The supposed differences between Aztec hieroglyphics and Maya manuscripts do not exist.” (Proc. Roy. Geog. Soc. in Science, 1889, xiii, 295.)

Among these preserved picture writings are a number of sufficient importance to have absorbed the attention of eminent and enthusiastic scholars. They are called “codices,” and they have been named from their discoverers, from their present locations, and from some historical fact connected with them (Bancroft, 1875, ii, 529; 1876, v, 192.) The word codex, or codice, is somewhat confusing in this connection, being made to cover also old documents in the Spanish language as well as paintings relating solely to the conquest. Since the appearance of Lord Kingsborough’s work and others mentioned by Bancroft the Mexican Geographic Society, Duc de Loubat, Thomas, and others have given to the world entire codices or parts in excellent form. Governments and institutions have liberally aided. Besides, the codices were mural inscriptions, calculiform characters on altars, monoliths, cartouches on ornaments, paintings on pottery, and glyphs on hard wood (Starr).

The list of efforts at their decipherment would transcend the limit of this publication. The names of most of them will be associated with the works of Brinton, Rau, Seler, Försteman, Maudslay, Gunckel, Thomas, Saville, Goodman, etc.

Mexican and Maya codices, their locations and publishers.

Names.	Location.	Published in—
Berlin	Royal Library	Kingsborough, ii.
Baranda	Museo Nacional de México	Chavero, 1892.
Bodleian	Facsimile in Bodleian Library, Oxford.	Kingsborough, i, ii.
Bologna	Library of Scientific Institute	Kingsborough, ii; Duc de Loubat.
Borbonicus	Palais Bourbon, Paris	Duc de Loubat.
Borgia	College of the Propaganda, Rome.	Kingsborough, iii, 66; Duc de Loubat.
Boturini	Boturini Collection	Kingsborough, i.
Campos	San Juan de Cuauhtlantzinco, Pueblo.	Starr, 1898.
Colombino	Museo Nacional de México	Antigüedades Mexicanas.
Cospianus		Duc de Loubat.

Mexican and Maya codices, their locations and publishers—Continued.

Names.	Location.	Published in—
Cortesianus (Mayan).....	Royal Museum, Madrid.....	Madrid.
Dehesa	Museo Nacional de México	Antigüedades Mexicanas.
Del Rios (3738)	Vatican Library	Duc de Loubat.
Dresden (Mayan)	Royal Library, Dresden.....	Kingsborough, iii; Förstemann, 1880.
Fejervary	Possession of M. F., Hungary.....	Kingsborough, iii.
Fernandez Leal	México	Peñafiel.
Lienzo de Tlaxcala.....	Museo Nacional de México	Antigüedades Mexicanas.
Mendoza	Bodleian Library, Oxford.....	Kingsborough, i, v, vi.
Peresianus or Mexicanus II (Mayan)	National Library, Paris	Archives Paleographiques, Paris, 1869, i.
Porfirio Díaz	Museo Nacional de México	Antigüedades Mexicanas.
Ramírez .....	.....	.....
Telleriano Remensis	National Library, Paris	Kingsborough, i, v, vi; Duc de Loubat.
Relievo de Chiapas.....	Museo Nacional de México	Antigüedades Mexicanas.
Troano (Mayan)	Madrid	Brasseur, 1869; Thomas, 1882.
Vaticanus	Vatican Library, Rome	Kingsborough, ii, iii, v, vi; Duc de Loubat.
Vienna	Imperial Library.....	Kingsborough, ii.

The social organization of the aboriginals in México is one of the most excellent fields of research on account of the perspective which it presents. Here, in this limited area, which one may traverse in a summer vacation, are to be seen every grade and variety of the gentile system. On one extreme is the well-known mother rule, where descent is in the female line and there is little of private property or privilege; on the other is the picture of a great military confederacy of tribes, wherein father-right prevailed, where officers were elective, and a council of delegates from each tribe was charged with all affairs of state. Into this truly American social order it was easy for the early Spanish authors to read their own system and to use such terms as king, prince, general, and so on, but to the careful student the organization and functioning of society are explicable through a wider study of various peoples on the Western Hemisphere. Besides, there were, as has been pointed out, several linguistic families in México, who were as wide apart as Aryans and Magyars in Austria-Hungary; but even these had their agreements and treaties according to the plan of democracies. (Bandelier, 1880, with rich addition of footnotes.) Confirmatory of the thoroughly American gentile system of government and social order in México are the facts relating to the holding of real estate. It is not necessary to appeal to the tribes north of the Tropic of Cancer; in the more highly cultured tribes, as Bandelier shows with great erudition (1878), no man owned any real estate, no office owned land, all government land was independent of the rulers, conquest was never followed by partition of land, the notion of ownership in fee, of sale, barter, conveyance, or alienation was undreamed of.

The Southern Confederacies had not literally beaten their swords into plowshares, but they had converted the hunting implements, weapons, and devices, with many improvements, into the apparatus of war.

The organization of the army was not different essentially from that of their civil government. As in the Old World so in the New, there were storm centers where clouds of war met and spent their fury. The valley of México was one of these; hence the Nahuatlan tribes attained the highest point of military discipline of the New World. But their weapons were only bows and arrows, darts, throwing sticks (atlatl), javelins, and spears, for piercing; slings and clubs for striking, and the most murderous club, lined on either side with spalls of volcanic glass, for slashing. For defense they had shields, cotton armor, and wooden helmets, like those of the Thlinkit warriors in recent times. As is customary among the northern Indians, the Mexican soldiers decked their military equipments with gorgeous featherwork.

The organization of the army, the tactics, the strategy, the military engineering, the fortified places of the more civilized tribes, doubtless were of a higher order than the guerrilla methods of the United States tribes of two hundred years ago. On the other hand, they err who would read into these the vocabulary of European war methods of the times. Bandelier says (1877, 161): "The Mexicans were not subject to a despotical power, but organized after the principles of a barbarous but free military democracy."

In the comparative sense, religion consists in what men think of a spirit world and what they do in consequence; the former is their creed, the latter their cult or worship. Creed has to do chiefly with the personnel and physiography of the spirit world, and it will be noted that in some measure that world is the reflection of this. Its supernatural beings are organized as a society, and their motives as well as their conduct have reference to human beings.

In cult, human society is organized, buildings are erected, costumes are worn, food is eaten, days are observed, and certain austerities practiced, all with reference to beings unseen to mortal eyes, but cognizable by a special sense. The most refined art and music and the best of everything go to the gods.

On this definition the Mexican religion had its creed and its cult, its heaven and its pantheon, as well as its temples, altars, and priesthood; its mythology and worship.

The northern or pueblo tribes of México must be studied in the light of the pueblo tribes of Arizona, worked out by members of the Bureau of American Ethnology. Its wild tribes lived near to their unseen world like their brethern of the north. We are here concerned with the religion of the southern families. Bancroft (1875, iii) devotes five hundred pages to the religion of the Pacific coast tribes; the larger part is given to the topic here considered. On every monument, sculptured slab, decorated wall or vase, the spirit world is manifested. It is a Mexican Pantheon. The warrior god is supreme; the priests are ministers in a church militant. Sacrifice, incense, pomp in worship,

revolting rites, prolonged rituals, obtrude themselves and override industry and art.

The æsthetic side of Mexican life in aboriginal times covered a wide area, but nowhere reached an enlightened stage. There were public fêtes and games, but there was no drama *per se*. There were social rules or fine art of behavior—in the open, in the family, at the feast, every one had a place; but behavior where there was so little furniture scarcely rose to etiquette. There was fine art of dress and its accessories, but not far above that of the Mandan Indians. Vocal music was singing in unison, and there are those who say that the Mexicans had a scale of notes which can be reproduced on an organ with fixed pipes, but this is denied. The musical instruments of the Mexicans were flageolets and flutes of wood, bone, and pottery. Whistles of grotesque shapes, reed instruments of unique form, drums of wood (*teponaztli*), and with heads of membrane (*huehuetl*), rattles (*ajacaxtli*), and bells (*yotl*), but the existence of stringed instruments is doubtful. In some of the sculptures students see representations of this class, but others as clearly witness the notched rattle. (Seler, 1898.)

As for the graphic and glyphic art, sculpture, and architecture, the student can not fail to note everywhere the sense of the beautiful struggling to help symbolism and to disengage itself from its more childish forms. Unity, proportion, symmetry are all there, and some of the world's standard forms have been reached. One well qualified to judge has said; "Most of the motives employed in embellishment have their origin in religion; their use was first significant and second æsthetic * * * All the sculptor's art is crude as compared with civilized art, but it is virile and full of promise of higher achievement. * * * There is lack of perspective and a mixing up of sizes, and the general style of presentation is suggestive of that of the ancient Egyptians." (Holmes, 1895, 52.)

No other part of the Western Hemisphere has such abundance and variety of attractions for the archaeologist as the territory of the Republic of México. In order to comprehend this area one must study the pyramidal mounds of the Mississippi Valley; the immense log buildings, sculptures, and totem posts of the north Pacific coast; the massive walls and composite arrangement of the pueblos; the infinite variety of geometric patterns and designs on basketry; not neglecting, finally, the full-costumed Crow warrior of Montana, wearing his decorated breech clout and moccasins, and gorgeous headdress of eagle plumes, which spans his head like a huge rainbow and descends to the ground in a long train. It is not necessary to maintain that the sculptors of southern México were the immediate blood kindred and colinguists of all these widely scattered tribes. Only they use the same alphabet and art motives. The Mexicans were mound-builders,

totem carvers, pueblo designers, fretwork weavers, and costumers in stone, the material which, more than all others combined, evoked the virile qualities of early races.

Regarding the antiquities of México, the present territory may be further subdivided into (1) The Mayan province, east from Tehuantepec, including Yucatán, belonging, perhaps, to Central America; (2) the Nahuan-Zapotecan province, reaching from Quemada, in Zacatecas, southward to Tehuantepec, revealing an advanced and somewhat mixed culture; (3) the Pueblo province, with its compound, storied houses and smooth, coiled pottery, which is not bounded northward by the boundary line, but reaches far into the United States; (4) the wild province, home of cliff dwellers and devoid of architecture and pottery. The antiquities of México do not end with the boundaries of the Republic. At the north, the Casas Grandes, in western Chihuahua, on Casas Grandes River, is an immense adobe structure, allying itself with the present and ancient pueblos of Arizona and New Mexico. Moreover, there were throughout the same region and southward natural and artificial cave dwellings. (Lumholtz, 1898.) At the southeast, México passes insensibly from the Mayan culture of Yucatán and Chiapas into the antiquities of Guatemala.

The mural remains of the Republic are comprised within narrow limits, extending from the sixteenth to the twenty-second parallel, from Soconusco to Quemada. Yet in this contracted area are to be found more structures of stone than in all America besides.

Of this architecture there are held to have been several schools. Indeed, this should be looked for, since, in addition to the natural gates or opportunities opened by the several environments, there were on this territory, in rivalry, several linguistic families. In Yucatán and Tabasco was the Mayan family, with an outlying branch in northern Veracruz. Next to them, westward, were the Zapotecan and the Zoquean family, and in a circle about the City of México were Nahuatlán, Totonacan, Otomian, and Tarascan tribes. (Brinton, 1891, 128-162.)

Every variety of material enters into the permanent building, to wit, the plain dirt heap, the modeled dirt heap or mass; even mountains were remodeled; sun-dried clay, either as bricks or in larger masses; stone and clay or other bonding material, mixed in rubble, used in vast quantities; walls faced with uncut stone, which in some localities was supplied by nature in good form; cut stone in walls laid up without adhesive material; stone walls laid in clay, mortar, and cement; carved architectural features; relief carvings; sculptures in the round. As for the adhesive substances, besides clay and other natural cements, lime mortar has been mentioned and the possibility of its existence denied, but caustic lime was not beyond the Mexican builders, since burnt shells occur universally as a degreassant in American pottery. There was no lack of durable wood to serve as lintels to doors and to

support ceilings. This material, doubtless, was used for doors, partitions, screens, and interior decorations, and was cut, hewn, and carved with great skill. (Holmes, 1895, 25.)

The architecture was oversolid, and consisted of rough masses of dirt and rude masonry, faced with smoothed cut stone. Layard encountered just this combination in excavating Nineveh. A recent investigator calls attention to the lack of the best elements of construction. (Holmes, 1895, 27-30.) The arch and the dome were unknown. Long pentagonal openings, with horizontal bases, called false arches, were the best that the architects could do. On this overmassive structure there was an equally barbaric excess of decoration—false fronts, roof combs, cornices, mosaic and stucco work. One imposing feature is the terrace and stairway presented in endless variety, affording not only access to superior structures, but sitting room or grand stand for the laity.

The two central features about which all plazas, paved ways, banks of earth, and walls or parapets cluster are the pyramid and the squared structure, the mound and the log house made in stone. Of the former, the function is largely outside; of the latter, owing to the solidity of the walls, it is only partly inside. The pyramid may have additions interior and inferior, but its attractive parts are exterior and superior. The built-up and squared structure lends all its parts, indeed, to the architect, the modeler, and the sculptor, but it also was to be gazed at from without. The pyramid was divided into stories by placing a series of truncated pyramids one above another and by cutting out terraces from a single form.

In the most important remains there is such evident relationship between structure and structure as to prove that one purpose runs through the whole. And while some great buildings give evidence of accretions, others, says Holmes (1895, 23), for example, the palace at Uxmal and the castillo at Chichen, show that when the building began the whole plan to the minutest detail had been thought out. Very few of the buildings are accurately oriented, as that term is commonly understood. Certainly the modern style of laying off cities in rectangles was as little known in México as among the European contemporaries.

Their purposes are easily harmonized with the environment, the kinship system, and the culture system of the peoples. Some of them are forts, to defend whatever was in them. Some of them were religious, with their court of the women, court of the laity, and the other societies, court of the society and pathway of the priests to a kind of shrine or holy of holies. If only on some bright, sunny day the pageant could return, what a picturesque sight one of those temple structures would afford, having every terrace and stairway filled with gay costumes, to which gold and silver and precious stones, the efflorescence of the fields, and the plumage of birds lent their willing service.

For the first time the sites of archæological remains in México are here codified in the alphabetic order of States. Such a provisional list will serve future investigators as a starting point for additions and corrections. A distinction should be made between relics and remains. The former are movable and personal, and can not always be relied on for locations, but remains are stationary and are useful on the spot. They should be guarded with the greatest care both by the Government and by public spirit against destruction or removal.

ANCIENT REMAINS IN MÉXICO.

AGUASCALIENTES: No remains reported.

BAJA CALIFORNIA: Rock paintings and inscriptions.

CAMPECHE: Paved roads, or calzadas; terra cotta idols, etc.

CHIAPAS:

Palenque, ancient city of vast extent, Charnay, 1887; Holmes, 1895; Mandslay, 1897.

Lorillard City, ruins resembling Palenque, Charnay, 1887.

Ocoingo, groups of ruins, sculptures, hieroglyphs.

CHIHUAHUA: *Rio des Casas*, adobe pueblos, Casas Grandes, Thomas, 1899.

COAHUILA:

San Lorenzo, rock paintings, mummies, relics.

San Martín, ruins and pottery.

COLIMA: No remains reported.

DURANGO:

Bolsón, rock paintings and carvings, mummies.

La Breña, caves yielding relics; between Suchil Valley and Chalchihuites, Chichimec remains.

GUANAJUATO: Only cave dwellings and relics.

GUERRERO: Foundations, remains of settlements.

Una, ruins and burial places.

Tlapa, tombs called Teteles.

HIDALGO: *Tula*, pyramid, sculptures, idols, relics, Charnay, 1887; Peñafiel, 1890.

JALISCO: Artificialized hills.

L. Chapala, vestiges of ancient settlements and pottery, Starr, 1897.

MÉXICO:

Actopan, pottery relics,

Ahuehucpa, statue bearing hieroglyphics.

L. Chalco, causeways across the lake; traces of ancient city on Xico Island; sculptures on Misquique Island; sculptures at Xochimilco; carved cylindrical stones at Tlahuac; ancient town of Culhuacan; idols, heads, fallen pyramids at Tlalmanalco.

Chapultepec, carvings on cliffs.

Malinalco, ancient wood carvings.

México City, or *Tenochtitlan*. In the city all temples, etc., have been razed; calendar stone, sacrificial stone, statue of Coatlicue, sculptures at Tlatelulco; ruins of fortified hill at Tenango, Peñafiel, 1890; Holmes, 1897.

Mecamecan, rock pyramid, carved.

Navajas, obsidian mines.

Ozumba, carved blocks of stone.

Remedios, terraced, stone-faced hill.

Tacuba, ruins, pyramids of sun-dried bricks.

MÉXICO—Continued.

Tezcuco, causeway at Chapingo; idols, pottery, relics at Contador; terraced hill and aqueduct at Tetzcutzinco (Reyes, 1888); stone wall in mortar at Huejutla; ruins of ancient city at Teotihuacan, immense pyramids and paved way, Charnay, 1887; Holmes, 1897; Peñafiel, 1899.

Otumba, ruins at Tulacingo and San Miguel.

Xonacatepec, stone masks; carved circular stone.

Yahualua, tombs, with stone images, northward.

Tyupilco, buildings of thin blocks of stone.

Zacualpan, stone masks and relics.

MICHOACÁN: Opals and other gems, and remains at Jiquilpán; small mounds at Irimbo; rock carvings on Aniche Island; ancient capital of Tarascos at Zintzuntzan, L. Patzcuaro, Leon, 1888-1890.

MORELOS:

Xochicalco, terraced hill, paved roads, galleries, hill covered with masonry, summit platform, fine sculptures, Peñafiel, 1890, ch. viii.

Cuernavaca, figures carved on boulders; temple pyramid.

Tepoztlán, Saville, 1896; Seler, 1898.

NUEVA LEON: No antiquities reported.

OAJACA:

Tehuantepec, pyramids with stairs, fortresses, ruins, underground tombs, pottery, Estrada, 1892. Ruins of Quiengola, 1896.

Magdalena, statue of Zapotec prophet, Wixepcocha.

Petapa, caves with painted walls.

Loullaga, mound and hieroglyphics.

Chihuittán, ancient bridge.

Guatulco, ruins of ancient city.

Tlacolula, mound of earth.

Quiyechapa, ruined fortress.

Etla, underground tombs, images.

Peñoles, skull preserved by lime; pyramid at Tepantepec, tombs at Teotitlán.

Quilapan, mounds everywhere.

Monte Albán, fortified holy place, subterranean chambers, pyramid, hieroglyphics, etc. Holmes, 1897.

Zachila, mounds, burnt bricks, walls, statues. Tombs of Xoxo (Saville, 1899).

Mitla, finest ruin in the State and one of the grandest in Mexico. Charnay, 1867; Peñafiel, 1890; Holmes, 1897.

Quietepec, hill covered with ruins, platforms, terrace walls, pyramid; at Tuxtepec mound 63 feet high.

Hualmapam, sculptures in low relief, pottery, gold objects.

Yanguiltán, sculptured human figures.

PUEBLA:

Tehuacan, ruins of stone structures.

Chila, pyramid of hewn stone, cement covering, stairway.

Tepiaca, sculptured head and slabs.

Tepire, storied pyramid, hewn stone, lime mortar.

San Cristóbal, storied pyramid, stairway, graded way.

Cholula, storied pyramid, 1,440 feet square, 200 feet high.

Chalchicomula, storied pyramid with stairs.

Quatulhquelchula, relief; ruins at San Pablo.

QUERÉTARO:

Querétaro City, fortified hills, pyramids, works.

Pueblita, stone walls, sculptures, mounds.

Ranas, forts, pyramids with stairs, burial mounds.

QUERÉTARO—Continued.

Toluquilla, ancient city and fort. Reyes, 1881.

San Juan, mound containing idols.

SAN LUIS POTOSÍ: No remains reported.

SINALOA: Vestiges of ruins at Mazatlan.

SONORA: Ruins at Babiacori; grottos at Sohuaripa.

TAMAULIPAS:

Encarnación, stone idol.

Cramelote Creek, mounds, dressed stone, images, pottery.

Salt Lake, pyramidal mounds, stone faced, with steps.

Zopila, mounds faced with stone, carved stones, pottery.

Tampico, idols of basalt, carvings, pottery.

TLAXCALA:

Malinche, walls, pyramids, stone images.

San Pablo, kneeling figure in stone.

Natividad, terraced hill, ruins, standing stones, relics.

Cuacatlan, fort, ditches, underground ways.

Tlaxcala, sculptures, pottery, stone bridges, brick parapets, obelisk at Pueblo de los Reyes, wall on frontier of State.

Tizatlan, ruins, called Xicotencatl.

VERACRUZ:

Veracruz City, ports, pyramids, foundations, graves, west of the city, in abundance.

Sacrificios I, temple, sepulcher, relics.

Carapa, ruined city; colossal head.

Orizaba, sculptured yokes, carvings, grotto.

Jalapa, serpent carved in rock.

Puente Nacional, storied pyramid, with stairs.

Córdoba, line of forts.

Centla, terraced pyramid faced with hewn stone, forts.

Huatusco, pyramid with broad stairway, forts.

Mirador, baths and rock inscriptions.

Zacupán, pyramid, plaza, terraced walls.

Tlacotepec, forts and aqueduct.

Consoquitla, fort, plastered pyramids, idols, relics.

Calcahualco, forts, pyramids, columns.

Misantla, pyramids of hewn stone pavements, ruins.

Jalancingo, walls of hewn stone, subterranean shrines.

Papantla, terraced storied pyramid; other pyramids at Mapilca ranch.

Tusupan, pyramid with stairs, building on top.

Metaltoyuca, pyramids of hewn stone, pavements.

Panuco, statues and relics.

San Nicolas, ovenlike chamber, ruins.

YUCATÁN:

Uxmal, immense Maya ruins; also pyramids, sculptures, and statues near Uxmal, at Senuisacal, Muna, Saebé, Nohcaab, Xcoch, Nohpat. Charnay, 1887; Holmes, 1895.

Kabah, group of 16 structures, storied buildings, sculptures, arches; southeast from Kabah, ruins at Sanaacte, Xampon, Chaek, Sabacché.

Zuyi and Labná, Charnay, 1887; Thompson, 1897b.

Kewick, Xkichmook, and Xul, ruined cities and paintings. Thompson, 1898.

Tekax, ruins at Sacacal, Tieum, Santa Maria and Chacehob.

Loltun, caves, underground water supply. Mercer, 1897; Thompson, 1897a.

Akil and Mani, remains of cities.

YUCATÁN—Continued.

Chichen Itza, ruined city and forts, sculptures; nearby ruins at Tinum, Espita, Xocen, Sitax, Coba. Charnay, 1887; Holmes, 1895; Mandslay, 1897.

Ticul, pyramidal mounds, ruins. Charnay, 1887.

Mayapan, mounds, sculptures, remains of ancient Maya capital.

Mérida, on ruins of ancient city of Tahoo.

Ake, ruins of rude architecture. Charnay, 1887.

Izamal, pyramids, sculptures. Charnay, 1887; Holmes, 1895.

Bolonchén, wells (cenotes), sculptures.

Labphak, grand Maya ruin.

Turbide, mound of ruins, ancient town, remains near Noyaxche, Macoba, Mankeesh, Jalal, Yakatzib, Becanchen.

Tuloom, walled town. Holmes, 1895.

Cozumel, buildings and cisterns. Holmes, 1895. Ruins also at Point Nisuc, mouth of Petampich River, Kanenne Island, Mujeres Island.

Cayo Ratones, Cape Catoche, Yalahao, Emal, Monte Cuyo, Rio Lagartos, Port Silan.

Marcanú, mounds with galleries, ruins, señotes (underground water supplies).

Owing to the geological formation there are no water courses on the surface.

ZACATECAS:

Quemada. Immense ruins on mesa, roads, mounds, dressed stone, terraces, but no inscriptions or architectural decorations. At Quemada, coming southward, begin those monuments in stone that mark the virile culture of southern Mexico as against the feminal arts in clay farther north.

In order to make this brief summary valuable as a guide to students in Mexican archaeology and ethnology, a list of modern works is appended¹ which have been printed since H. H. Bancroft's *Native Races of the Pacific States* (1874-75) and Justin Winsor's *Narrative and Critical History of America* (1889) appeared. For earlier authorities the reader can not overlook Bandelier's footnotes and that wonderful result of patience and accuracy, Sabin's catalogue of works relating to America. In the text of this article the titles here given are referred to by dates, following the plan of Dr. C. S. Minot.

¹See Chapter XX for list.

CHAPTER IV.

GOVERNMENT AND CONSTITUTIONAL ORGANIZATION—ARMY AND NAVY.

The Constitution now in force in México, originally promulgated February 5, 1857, and subsequently amended, declares that the Mexican Republic is established under the representative, democratic, and federal form of government, composed of States free and sovereign in everything relating to their internal administration, but united in one single federation in accordance with the principles set forth in said Constitution. The Supreme Government is divided into three coordinate branches, viz, Legislative, Executive, and Judicial.

The legislative power of the nation is vested in a general Congress, consisting of two Chambers, the Deputies and the Senate. The Chamber of Deputies is composed of representatives of the nation elected every two years by the Mexican citizens and in the proportion of one Deputy for every 40,000 inhabitants, or fraction over 20,000, the term of service being two years, an alternate member being elected for each Deputy.

The requisite qualifications to be a Deputy are: To be a Mexican citizen in the full exercise of his rights, 25 years of age, a resident of the State or Territory where chosen, and not to belong to the ecclesiastical state. In 1897 there were 227 members in the Chamber of Deputies.

The Senate consists of two Senators for each State and the Federal District, chosen in the same manner as Deputies, and subject to the same limitations as to citizenship, residence, and civil status, but the age limit is 30 years, and the term of service four, half the Senate being renewed every two years.

Federal officeholders receiving a salary are ineligible for election to either Chamber.

The Congress has two ordinary sessions annually—the first, which may be extended thirty days, beginning on September 16 and ending on December 15, and the second may be prorogued for fifteen days, convening on the 1st of April and adjourning on the last day of May.

During the recesses of Congress a permanent committee, with limited legislative functions, sits, composed of 29 members, 15 being Deputies

and 14 Senators, appointed by the respective Chambers on the eve of adjournment. The duties of this committee are: To give assent to the calling out of the National Guard for use beyond the limits of their respective States and Territories; to call, on their own motion or at the instance of the President, extra sessions of either or both Chambers; to confirm certain Executive nominations; to administer the oath to the President and Justices of the Supreme Court; to report on all matters unacted on by the previous Congress, so that the next may have business to take up immediately upon convening.

The Executive power is lodged in a single individual, known as the "President of the United Mexican States."

The President is elected indirectly by electors chosen by the people. His term of office is four years, commencing on the 1st day of December after election. By an amendment to the Constitution, under date of December 20, 1890, he may be reelected indefinitely. Temporary vacancies in the Presidency are filled by the person serving as Secretary of State, while in case of death or permanent disability a provisional President is elected by Congress, who discharges the office until one is elected by the people.

Following are the qualifications requisite for President:

(1) To be a native-born Mexican citizen, in the full exercise of his rights.

(2) To be 35 years of age.

(3) To not belong to any ecclesiastical order.

(4) To be a resident of the country at the time of election.

The President is assisted in the discharge of his duties by a Cabinet, consisting of seven Secretaries, heads of the Departments of Foreign Relations; Finance and Public Credit; Communications and Public Works; Promotion, Colonization, and Industry; Interior; Justice and Public Instruction; War and the Navy.

Cabinet officers must be native-born Mexican citizens, and at least 25 years of age. All Executive regulations, decrees, and orders must be countersigned by the head of the department to which they refer, otherwise they are inoperative.

The salary of the President is \$50,000 per annum, and of the Cabinet officers \$15,000.

The judicial power is vested in the Supreme Court of Justice and the district and circuit courts. There are three circuit and thirty-two district courts. The Supreme Court of Justice is composed of eleven "ministros," or justices, four alternate justices, an Attorney-General, and a public prosecutor. Their term of office is six years, and they are elected by the people indirectly, in the same manner as Deputies and Senators. The qualifications required are to be learned in the law, in the judgment of the electors; to be at least 36 years of age, and to be Mexican citizens in the full exercise of their rights.

Federal courts have jurisdiction—

(1) In all cases arising from the enforcement and application of Federal laws, save when such application affects only private interests, in which case the ordinary courts of the States, Federal District, and Territories shall be competent to assume jurisdiction.

(2) In admiralty cases.

(3) In cases to which the Federation is a party.

(4) In cases arising between two or more States.

(5) In cases arising between a State and one or more citizens of another, or between two or more States.

(6) In civil or criminal cases arising from treaties concluded with foreign powers.

(7) In cases affecting diplomatic and consular agents.

The Supreme Court of Justice has original jurisdiction in all cases arising between two States, and in those wherein the Union is a party. This court must also settle all controversies arising among the Federal courts, between these and the State courts, or between the courts of two States. The Supreme Court is also the court of last resort in all other cases here mentioned.

The jurisdiction of the Federal courts extends also to all cases growing out of (1) laws or acts of any authority infringing on individual rights; (2) laws or acts of the Federal authority violating or limiting the sovereignty of the States; (3) laws or acts of the latter encroaching on the Federal authority.

The salary of Supreme Court justices is \$5,000 and of circuit and district judges \$4,000 a year.

As provided by the Federal Constitution, the interior government of the States is republican, representative, and popular, and is divided into the same branches as the General Government.

1. The legislative power in the large majority of the States is vested in a single representative body called a congress, the members of which are called deputies, and are in most States elected indirectly by the people, serving two years.

2. The executive power is lodged in a governor, elected, almost without exception, by indirect vote of the people, and serving for four years.

3. The judicial power in the greater number of States resides in a supreme court of justice and inferior courts and judges.

The States are divided politically, as a rule, into districts governed by a *jefe político*, or a prefect. The minor divisions are municipalities, the local authority being an *ayuntamiento*, corresponding to the town council in the United States of America.

By the Federal Constitution the States are prohibited from—

(1) Concluding any alliance, treaty, or league with another State or foreign powers, except the league which may be formed between frontier States for offensive or defensive warfare against savages.

- (2) Issuing letters of marque or reprisal.
- (3) Coining money, issuing paper money, stamps, or stamped paper.
- (4) Obstructing the transit of persons or goods crossing its territory.
- (5) Prohibiting or molesting, either directly or indirectly, the entrance or exit to or from its territory of national or foreign merchandise.

(6) Obstructing the circulation or consumption of national or foreign goods by means of imports or taxes that may be exacted through local custom-houses, by requiring the inspector of registration of packages, or by requiring the documentation to accompany the merchandise.

(7) Decreeing or maintaining in force laws or fiscal decrees which may cause differences of taxes or requisites, by reason of the source of national or foreign merchandise, whether these differences be established in regard to a like production in that locality or on account of like production from different sources.

Nor can they, without the consent of the Congress of the Union—

(1) Establish tonnage or any other port dues, nor impose burdens or duties upon imports or exports.

(2) Maintain at any time a standing army or ships of war.

(3) Make war by themselves on any foreign power, save in cases of invasion or of danger so imminent as to admit of no delay, in which cases they must immediately report to the President of the Republic.

It is the exclusive faculty of the federation to obstruct merchandise, imported or exported, or which passes in transit through the national territory, likewise to regulate at all times, and even to prohibit for reasons of policy and security, the circulation within the Republic of all merchandise from whatever source; but the said federation can not establish or decree in the District or Federal Territories the taxes and laws expressed as regard the States.

Each State is bound to deliver, without delay, criminals from other States to the authority demanding them.

The Federal District and the Territories are, as in the United States of America, under the control and jurisdiction of the Federal Government, although the local authorities are elected by the people, as are Deputies and Senators to the National Congress. The population necessary to entitle a Territory to statehood is 120,000 inhabitants at least.

The Mexican Constitution recognizes that the rights of man are the foundation and the end of social institutions, and consequently everyone is bound to respect and give support to the guarantees granted by it; that the national sovereignty is essentially and originally vested in the people; that all public authority emanates from the people and has been instituted for the good of the people; that the people have, at any time, the inalienable right of altering or modifying the form of government; and exercises its sovereignty through the national and State governments as prescribed by the Federal Constitution and the

constitutions of the several States, the latter constitutions in no case whatever being allowed to obstruct the provisions of the Federal compact.

All persons born within the territory of the Republic are free, and slaves become free, and are under the protection of the law upon entering the country. Education is free, except as regards the exercise of certain professions regulated by the laws. Freedom to exercise the liberal professions, freedom of thought and of the press, are guaranteed, the latter with the restrictions imposed by the rights of others, peace and public morality. The rights of petition and of peaceful organization are recognized. The right to own and carry arms for lawful self-defense and protection is also recognized, subject, however, to the restrictions of the law; also the right to freely enter, leave, and travel over the Republic and to change one's residence, without passport or any similar document, subject, however, to the judicial or administrative authority in cases of criminal or civil responsibility.

Titles of nobility, hereditary honors, and prerogatives are not recognized, nor is the authority or judgment of special laws or privileged courts. *Ex post facto* laws and the conclusion of treaties for the extradition of political offenders, also such treaties or agreements as shall in any manner alter the rights and guarantees accorded to men and citizens by the Constitution are expressly prohibited, as well as the right of search without a warrant issued by competent authority.

Imprisonment for debt of a purely civil nature is abolished. Violent measures in the support of individual rights are prohibited, as the administration of justice by the courts is done gratuitously. Arrest, except for offenses meriting corporal punishment, is prohibited, as is also detention without trial for a longer period than three days, unless justified as prescribed by law. The authorities are empowered to punish severely any ill treatment inflicted upon prisoners, either at the time of arrest or while imprisoned, as well as any other abuses. The rights of the accused are guaranteed, the application of penalties other than those purely correctional being limited exclusively to the judicial authority. Mutilation, branding, whipping, clubbing, torture, excessive fines, confiscation of property, and any other form of infamous punishment is prohibited. The death penalty is limited to the crimes of high treason during a foreign war, highway robbery, arson, parricide, willful murder, high military crimes, and piracy, as provided by law.

The inviolability of correspondence circulating through the mails is recognized, the infractors being severely punished. Private property can not be occupied without the consent of its owner, except in cases of need for public service, an indemnification having been previously paid, as prescribed by law. The quartering of soldiers, in time of

peace, upon the property of individuals is forbidden, as well as in time of war, save under the regulations established by law.

No civil or ecclesiastical corporations of any description are permitted to acquire or manage landed estates, with the exception of the buildings directly devoted to the service or objects of the institution, nor are religious institutions permitted to acquire landed estates or the capital invested thereon, except as prescribed by law.

Monopolies of all descriptions, under pretext of industrial protection, are prohibited, excepting the Government monopolies of coinage and the postal service, and the limited privileges granted by law to patentees of any useful invention.

The President, with the concurrence of his Cabinet and the approval of Congress, or, during its recess, the Congressional Permanent Committee, may suspend all constitutional guarantees in case of invasion, grave internal disorder, or serious disturbance endangering the State, but only for a limited period and by means of general orders, such suspension, however, according to the law, not to affect individuals.

Section II of the Constitution declares that Mexican citizens are (1) all persons born in the country, or abroad, of Mexican parents; (2) all foreigners naturalized under the laws of the federation; (3) all foreigners acquiring real estate in the Republic or begetting children by Mexican mothers, unless distinct claim of citizenship elsewhere is avowed in due legal form. It is the duty of every Mexican to defend the independence, territory, honor, rights, and interests of the country, and to contribute to the general expenses, both of the federation and of the State where he resides, as prescribed by law.

According to the Constitution, the citizens of the Republic are those who, besides being Mexicans, are over 18 years of age, if married, or 21, if unmarried, and possess honest means of livelihood. Their prerogatives are, the right to vote in the popular elections; to be elected by vote to all the charges, posts, and commissions for which they are legally qualified; to organize for the purpose of treating of the political affairs of the country; to enter either the general army or the national guard, in order to defend the Republic and its institutions, and to exercise the right of petition in all matters.

The duties of the Mexican citizen are, to be inscribed in the register of his municipality, stating the amount of property he holds, or the trade, profession, or industry he is engaged in; to enlist in the national guard; to vote in the elections of his district, and to faithfully discharge the duties pertaining to any post to which he may be elected in the Federation.

Citizenship is forfeited. (1) through naturalization in a foreign country; (2) by serving, in an official capacity, the government of another country, or by accepting from a foreign government decora-

tions, titles, or charges—other than literary, scientific, or humanitarian—without previous consent of the Federal Congress. The law determines the cases and form entailing the loss or suspension of the rights of citizenship and the manner of rehabilitation.

Under date of May 28, 1886, a law was passed by the Mexican Government governing aliens and their naturalization, which is, in substance, as follows:

Aliens enjoy in the Republic the civil rights belonging to Mexicans and the guarantees granted by section 1 of title 1 of the Constitution, without prejudice to the Government's right to expel a pernicious alien.

For the acquisition of waste or public lands, real estate, and ships, aliens are not required to reside in the Republic, but they are subject to the restrictions imposed by existing laws; in the understanding, nevertheless, that every lease of real estate to an alien for a period exceeding ten years shall be deemed a full conveyance.

The Federal law alone can modify or abridge the civil rights enjoyed by aliens, in consequence of the principles of international reciprocity, and in order that the aliens may thereby be subject in the Republic to the same disqualifications as the laws of their own country impose on Mexicans residing there; hence the provisions of the civil code and of the code of civil procedure of the Federal District on this subject have a federal character, and shall be obligatory throughout the whole Union.

Aliens may be domiciled in the Republic for all legal purposes without losing their nationality. The acquisition, change, or loss of domicile are governed by the laws of México.

When the suspension of individual guarantees is declared under the provisions of article 29 of the Constitution, aliens, as well as Mexicans, are subject to the provisions of the laws decreeing the suspension, without prejudice to the stipulations of treaties.

Aliens are bound to contribute to the public expenses in the manner prescribed by the laws, and to obey and respect the institutions, laws, and authority of the country, subjecting themselves to the judgments and decisions of the courts, and having no right to have recourse to other measures than those which the law grants to Mexicans. They may appeal to the diplomatic channel only in the case of denial of justice or intentional delay in its administration, after exhausting in vain the ordinary means created by the laws, and in the manner prescribed by international law. Aliens can not enjoy any of the political rights of Mexican citizens. Aliens are exempt from military service. Domiciled aliens are bound, however, to perform police service when the security of property or the maintenance of order in the locality in which they are residing is involved.

Aliens taking part in the civil dissensions of the country may be

expelled from its territory as pernicious aliens, and are subject to the laws of the Republic as to the offenses which they may commit against it, without prejudice to the regulations of their rights and obligations during a state of war, by international law and treaties.

The laws ordering the registration of aliens are repealed. The Ministry of Foreign Relations alone can issue certificates of any given nationality in favor of the person requesting them. These certificates constitute legal presumption of foreign citizenship, but do not exclude proof to the contrary. The final proof of any given nationality is made before the competent courts, and by the means prescribed by the laws and treaties.

Aliens who have acquired real estate and who have had children born to them in México, or who have held any public office are bound to declare within six months after the promulgation of this law, if they have not done so previously, before the civil authorities of their place of residence, whether they wish to acquire Mexican citizenship or retain their own. In the former case they must immediately ask for their certificate of naturalization. If they fail to make the declaration in question they shall be considered Mexicans, except in those cases where there has been an official declaration to this end.

Colonists in México come under the provisions of this last article.

The following are among the general provisions of the Constitution: In time of peace no military authority can exercise any other functions than those intimately connected with military discipline. The state and the church are independent of each other, it being the exclusive right of the Federal Executive to exercise, in the matter of religious worship and external discipline, the intervention prescribed by law. Marriage is a civil contract, which, like any other act of the civil state of individuals, falls under the exclusive jurisdiction of the civil officials and authorities, as prescribed by law and having only the force and validity that law accords it. The Constitution is inviolable.

At the close of the protracted period of wars and revolutions which had distracted the Republic the Mexican army lacked, in general terms, the technical instruction and organization impossible to attain in the midst of active warfare. Since the establishment of peace the Government has taken two steps of prime importance toward the improvement of the army and navy of the country—one the complete reorganization of both branches of the service, and the other the reduction of the standing army. To this end the Military School, which has furnished many intelligent officers and engineers, has been reorganized, and academies have been founded. The old infantry armament has been replaced, at first by the Remington rifle and later by the Mauser; the most modern ordnance has been substituted for the obsolete artillery pieces; the national arms and powder factories have been equipped with the most improved machinery, and, in short,

everything has been done to place the army of the Republic on a footing with the general progress of the nation.

Shortly after the restoration of the Republic, in 1867, the army consisted of 37,103 privates, officered by 11 major-generals, 73 brigadier-generals, 1,041 colonels, lieutenant-colonels, and majors, and 2,335 commissioned officers.

According to the report of President Díaz, in 1888, the army had 16 major-generals, 84 brigadier-generals, 1,205 commissioned officers, 2,566 noncommissioned officers, and 29,367 privates, or a total numerical strength of 33,238 men. The latest statistical data (1897) give the following figures for that year:

Major-generals.....	10
Brigadier-generals.....	62
Commissioned officers.....	1,020
Noncommissioned officers.....	2,415
Privates.....	24,538
Total.....	28,045

It is estimated that this reduction represents a saving to the Government of over \$3,000,000.

“The Two Republics,” of México City, is authority for the statement that the Mexican Army at the present time consists of 8 major-generals, 53 brigadier-generals, 944 commissioned officers, 2,481 noncommissioned officers, and 27,247 privates.

The Navy has not as yet progressed beyond the period of inception. According to a Mexican official publication¹ it consists of a fleet composed of the following ships: *Democrata*, gunboat of the first class; *Independencia* and *Libertad*, both of the second class; *Oaxaca*, transport ship; *Donato Guerra* and *Veracruz*, light-house dispatches; *Yucatán*, a corvette, and the cruiser *Zaragoza*, a steel training ship. The gunboats are armed with breech and muzzle loading guns—five each—while their tonnage and horsepower are as follows: *Democrata*, 450 tons and 600 horsepower; the two second-class boats, 425 tons and 425 horsepower each, while the *Zaragoza* has a tonnage of 12,000 tons and 1,300 horsepower. The latter vessel was built at Havre in 1891, and made a trip around the world in 1896. Several gunboats are in process of construction, and a battle ship and a cruiser are projected.

The personnel of the Navy² consists of 90 officers and 500 men.

¹ Lista de los Buques de Guerra y Mercantes de la Marina Mexicana, etc., México, 1899.

² Mexico and the United States, Romero, p. 100.

CHAPTER V.

POLITICAL DIVISION—THE VALLEY OF MEXICO—FEDERAL DISTRICT.

The territory of the United Mexican States (Estados Unidos Mexicanos) is divided into 1 Federal District, 27 States, and 2 Territories, whose organization is almost identical with that of the American Union. The States, as before indicated, are free and sovereign in all matters pertaining to their internal administration, their government being vested in three heads, namely: State government, State legislature, and State judicial power.

The 27 States and 2 Territories, whose area, population, and capital cities are given on page 13, according to the classification used by the late Mr. Matías Romero in his work "Mexico and the United States," are the following:

Northern States, bordering on the United States.—Tamaulipas, Nuevo León, Coahuila, Chihuahua, and Sonora.

Southern States, bordering on Guatemala.—Yucatán, Campeche, Tabasco, and Chiapas.

Atlantic State.—Veracruz.

Pacific States.—Oaxaca, Guerrero, Michoacán, Colima, Jalisco, and Sinaloa.

Central States.—Aguascalientes, Durango, Guanajuato, Hidalgo, Morelos, México, Puebla, Querétaro, Tlaxcala, San Luis Potosí, and Zacatecas.

The two Territories are Tepic and Baja (Lower) California.

Southwest of the picturesque and extensive Valley of México lies the Federal District. This valley comprises an extensive plain, broken occasionally by isolated hills and surrounded by two large mountain chains. Several ranges cross the valley west and south, while on the east rises the great Sierra Nevada, formed by the majestic Popocatepetl and the Ixtacihuatl, the former rising 3,200 meters above the mean level of the valley and 5,452 meters above sea level and the latter 5,286 meters above the level of the sea. The northern boundary of the valley has not yet been defined. The area of the valley is given as 4,214 square kilometers, not including the 1,532 square kilometers of the Zumpanga valley, but both should be considered as forming one single valley, whose combined area is 5,746 square kilometers.

The waters of the valley form two distinct watersheds, one sloping in an easterly direction and the other toward the west, both embracing a number of small streams. Spurs of the lateral mountain ranges close the valley north and south, its center thus forming a basin where the waters of the two watersheds collect, forming five lakes, namely: Zumpango, 2,284 meters above sea level; Xultocán and San Cristobal, in the north, 2,277 meters above sea level; Chalco and Xochimilco, in the south, 2,280 meters and 2,268 meters, respectively, above sea level, and Lake Texcoco, on whose western shore lies the city of México. This last is the largest of all the lakes, being at the present day about 30 square kilometers in extent, though in former times it covered a larger area. As it lies in the lowest point of the valley all the surplus water of the other lakes drain into it during the rainy season, thus causing frequent inundations in the capital, to prevent which a system of drainage has been established.

The "Guia General Descriptiva de la República Mexicana,"¹ from which the information in regard to the Federal District has been obtained, divides the work undertaken for the proper drainage of the valley of México into four epochs. In the year 1449, during the rule of Moctezuma, the first dams connecting Tenochtitlán (México) with Tepeyac (Guadalupe) and Xochimileo were constructed. During the Colonial Empire (1553) a curved dam was built to replace those destroyed by Cortés during the war, others being built in 1604 and 1708. During the republican régime President Comonfort, in 1856, invited the competition of experts, both native and foreign, whose plans for the drainage works should fulfill certain conditions, among them being the stipulation that the waste waters be always used for irrigation purposes. Of the seven projects presented that of Engineer Francisco Garay was selected, and the work has lately been finished in accordance with his plans. The delay in the completion of the work was due to several disturbances in the country until, in 1885, President Díaz approved an appropriation of \$400,000 a year for the continuance of the work until it should be finished, which was successfully effected in 1896 at a cost of \$13,000,000. The work on the main canal, which necessitated the removal of 10,215,000 cubic meters of earth, kept 3,000 men and 5 dredging machines constantly employed. During the progress of the work upheavals of the soft bed of the canal occurred several times, thus rendering it necessary to commence the work anew. The canal starts at a point east of the city about on a level with Lake Texcoco, 1.30 meters below the mean level of México, crosses the river Guadalupe by means of an aqueduct 50 centimeters above the mean level of the river, extends for a distance of 48 kilometers, penetrating deeper and deeper into the earth until it enters a tunnel 10 kilometers in length, constructed at a slight incline and furnished with vent holes

¹ Compiled by J. Figueroa Domenech-Araluce, publisher, México, 1899.

to a depth of 94 meters. The works as they stand at present are practically completed, the only requisites being an improvement of the bed of the canal, the construction of some bridges, and a practical device at the outlet of the tunnel for a combination of lock gates which will insure control of the waste waters and regulate the level of Lake Texcoco, thus preventing inundations.

The Valley of México has undergone a great modification with the opening of the main canal. The waters, which formerly emptied into the small lakes, and owing to the configuration of the land, had no natural outlets, thus constituting at times centers of infectious diseases, are now drained into Lake Texcoco and can be controlled at will, either allowed to flow out when too abundant, or retained for irrigation purposes in case of need. As the valley is situated within the torrid zone, its climate might naturally be expected to be exceedingly hot, but as its altitude above sea level is 2,280 meters, the mean temperature is that of the temperate zone. During the summer the maximum temperature is reached at 2 o'clock in the afternoon in the months of April and May and does not exceed 26° C. (78.80° F.) while the lowest temperature in the morning during the same months is about 10° C. (50° F.), the mean temperature being from 18° to 19° C. (64° to 66° F.). During the winter, the minimum temperature recorded in the mornings of November, December, and January, is about 2° C. (35° F.), while the maximum experienced during the same months is from 19° to 20° C. (66° to 68° F.), the mean temperature being, therefore, about 12° C. (53.60° F.). As indicated by these figures, the mornings are cool and pleasant all the year and the afternoons temperate. There are only two seasons—the dry season from October to March, and the rainy season from April to September. The rainfall throughout the year is not very heavy, but as it is all utilized in the valley for irrigation purposes, it equals in its effect a much larger quantity. The winds blow from the northeast, but are never so strong as to become hurricanes.

The natural products of the valley are exclusively of an agricultural character and in keeping with the aridity of the soil, corn, wheat, and vegetables being the leading products in the order named. The "maguey" grows well, also certain fruits, such as the "zapote," peaches, apples, etc. The abundance of flowers during the whole year throughout the valley is as remarkable as the lack of mineral wealth, so plentiful elsewhere within the Mexican territory.

The Federal District—population 476,413¹—lies to the southeast of the valley, between $19^{\circ} 8'$ and $19^{\circ} 33'$ north latitude and $11'$ east and $13'$ west of the meridian of México. At its greatest length the District

¹The population given throughout the book is according to the latest corrections to the Census of 1895.

measures 49 kilometers from southeast to north, and its extent east and west is 40 kilometers. Official data in regard to the area give it as 1,200 square kilometers, not including the territory occupied by Lake Xochimilco and a portion of the Chalco Lake, both of which are now dry. Nearly one-half of the rural inhabitants of the District are Indians engaged in agricultural pursuits.

The Federal District is divided into four *prefecturas* and one municipality, as follows: Prefecture of Guadalupe-Hidalgo, chief town, Atzacapotzalco; Tacubaya, Tlalpán and Xochimilco, whose chief towns bear the name of the respective prefectures, and the municipality of México, capital of the Republic. The prefecture of Guadalupe-Hidalgo, population 16,498, embraces the northern portion of the district, being divided into two municipalities: Atzacapotzalco and Guadalupe-Hidalgo. The chief town of the prefecture is in constant communication with the capital by means of tramways. The municipality of Guadalupe is celebrated on account of the temple dedicated to Our Lady of Guadalupe, the patron saint of the Republic, who, according to tradition, appeared on the hill of Tepeyac within the town of Guadalupe. The soil of the prefecture is barren toward the east, but salt deposits, left through the evaporation of Lake Texcoco, are abundant, the main sources of exploitation being chloride of sodium, carbonate of soda, and nitrate of potassium. There is also a petroleum well at Guadalupe, and the surrounding hills yield fine building stones. There is not a great variety of vegetation, it being confined almost exclusively to the western portion of the prefecture, the leading produce being corn, vegetables, and maguey.

The prefecture of Tacubaya—population 32,433—occupies the southeast portion of the Federal District and is formed by five municipalities: Tacubaya, Mixcoac, Tacuba, Santa Fé, and Coaximalpa. The chief town is Tacubaya, the principal pleasure resort of the valley, and possessing fine buildings and gardens. The National Astronomic Observatory is a handsome building of modern architecture, erected on the highest point of the town, and containing some very fine instruments. The San Miguel and Monte de las Cruces mountain peaks form the southern boundary of the prefecture, and several streams originating on their slopes irrigate the land, which is the best agricultural section in the whole district, and supply drinking water for the City of México. As is the case throughout the entire district, corn is the chief agricultural product, though in Tacubaya and Mixcoac floriculture is carried on extensively—this industry giving rise to floral expositions and fairs. Fruits may also be cultivated with care.

The prefecture of Tlalpam—population 47,039—embraces five municipalities. It is situated between Tacubaya on the west, Xochimilco on the east, México on the north, and the States of México and Morelos

on the south. Talpam is also the name of its chief town, which, after Tacubaya, is the principal summer resort for the inhabitants of the capital. Situated on a picturesque spot, where the mountain slopes merge into the plain, it presents the peculiarity of possessing fertile lands in one section and absolutely sterile soil in another. The municipality of San Angel is noted on account of the "Feast of Flowers" held there, when prizes are awarded to cultivators of fruits and flowers. Embellished with innumerable gardens, filled with the richest flowers, and orchards producing the finest fruits and vegetables, and enriched with palatial dwellings, there are few more charming spots in the world. The southern portion of the prefecture embraces the slope of Mount Ajusco, whose ramifications extend northwardly as far as San Angel and Talpam, where the plain commences. The small streams of the locality empty into the canal of Xochimilco.

The prefecture of Xochimilco—population 48,662—occupies the eastern and southern portions of the district and contains nine municipalities. Xochimilco, the chief town, is one of the oldest cities of the Anahuac Valley. It lies on the shores of what was formerly Lake Xochimilco, which no longer exists in its original form, the waters having been drained into numerous canals for the advantageous irrigation of the now fertile lands surrounding it. The leading products are the same as in the other prefectures. The topography of this region is varied, and while it is not traversed by a single natural stream, the soil is extremely fertile, as the several canals carrying the waters of the rivers Talmanalco and Tenango to the Xochimilco Canal irrigate the lands, and in the mountainous region of the south sufficient moisture is supplied by the frequent rains to maintain a vigorous vegetation, corn being the principal product. The produce of the region is transported to the capital in canal boats.

From the foregoing it is evident that mountains and valleys are the main physical features of the Federal District. To the north rise the ramifications of the Sierra de Guadalupe, from 200 to 230 meters above the level of the capital, while the east and center is an extensive plain broken only by the Santa Catarina and Estrella mountains, respectively 200 and 150 meters above the level of the city. Sedimentary soil to a depth of 50 meters is found all over the plain, while the mountain regions are composed of eruptive rocks and granite. The small valleys between the mountains contain abundant vegetable matter.

The area of cultivation in the Federal District is about three-fourths its whole extent, the uncultivated lands measuring about 310 square kilometers. The value of property varies according to irrigation facilities and the means of communication. Public lands fluctuate between 18 and 20 cents per square meter, while other lands, in better condition, command as much as 50 cents. Within the City

of México property in the northern, southern, and eastern sections is quoted at 2 to 6 pesos¹ the square meter; from 30 to 35 pesos on the west side, and in the central section as high as 200 pesos per square meter.

The municipality of México embraces the capital proper and the surrounding country, its maximum radius being 8 kilometers, with a population of 331,781. Besides the city proper, the other points of interest in the municipality are Chapultepec, Santa Anita, and the Hot Springs of El Peñón.

The City of México is one of the most ancient cities of this continent, having been successively the capital of the Aztec Empire, of the Spanish colony of New México, and now of the Republic, being, in addition, the chief town of the Federal District. Its foundation dates from 1325 or 1327, when the Aztecs, after long wanderings, were directed by the oracle to settle on this spot where they had seen the auspicious omen of an eagle perched on a nopal (cactus) devouring a snake, which is at present embodied in the coat-of-arms of the Republic. The original name of the city, Tenochtitlán ("cactus on a stone"), was changed afterwards to México, in honor of the war god Mexitli. The Aztec civilization gave great impetus to the city's development, and in 1450, or about that time, the mud and rush houses of the first inhabitants had been replaced by solid stone structures. It had attained its highest degree of splendor at the time of the arrival of the Spaniards (1519), the number of dwellings being from 50,000 to 60,000 and the population being estimated at 500,000. The city was then about 12 miles in circumference and was intersected by canals, and, as it had been built, in part, on piles amid the islets of Lake Texcoco, grouped around the central inclosure of the great Teocalli, it was connected with the mainland by six long and solidly constructed causeways. México City has been the scene of many stirring events; among others, the destruction, in 1692, while under Spanish rule, of all the municipal buildings; several revolutions; capture by the United States Army, after the battle of Chapultepec, September 13, 1847, and by the French army, under General Forey, in 1863. Since the defeat of the French intervention scheme in 1867, and the overthrow of Maximilian, peace has been maintained continually and the city has become a great center of civilization.

The limits of the present City of México embrace almost twice the area of the old one, the extension having been in a northwesterly direction, and the new portion not being so regularly laid out as the old. There are about 900 streets and lanes traversing the city at right angles, from north to south and from east to west, and rail connections with Veracruz, 263 miles distant, on the Atlantic; with Acapulco on the Pacific, 290 miles; with Oaxaca, 205 miles; with Matamoros on the

¹ One peso is equal to \$0.464 American gold.

United States frontier, 863 miles, and with El Paso, Tex., a distance of 1,224 miles.

Among the principal public buildings are the Cathedral, considered the largest and most sumptuous church in America. It is built on the north side of the Plaza de la Constitución, which covers 14 acres, and is embellished with shade trees, gardens, marble fountains, and seats. The Cathedral was founded in 1573 by Philip II, of Spain, and the work lasted through the reigns of four monarchs, extending nearly a century, and was completed, with the exception of the towers, in 1667, at a cost of \$2,000,000. It is built on the same site once occupied by the Teocalli, or Aztec Temple, and measures 130 meters from north to south and 60 meters from east to west. The interior belongs to the Doric order of architecture, mingled with reminiscences of the Gothic style, a feature of the Spanish constructions of the sixteenth century. It is divided into five naves, decreasing in height from the center to the sides, and includes 14 chapels, while 20 striate columns support the graceful arches and vaulted roof, forming a latin cross, and the whole is surmounted by a beautiful dome, ornamented with paintings by the celebrated Jimeno. The high altar is supported by marble columns and surrounded by a tumbago balustrade with 62 statues of the same rich gold, silver, and copper alloy serving as candelabra. The elaborately carved choir is also inclosed by tumbago railings weighing 26 tons, and valued at \$1,500,000. The style of the exterior is Renaissance, with five domes, and two open towers 62 meters high.

Among the other temples worthy of mention are the Profesa, Loreto Santa Teresa, Santo Domingo, and San Hipólito, all of large proportions and containing artistic relics. The National Palace (Palacio Nacional) is another of the most remarkable public buildings as it is intimately connected with the history of the country, having been once the sumptuous abode of Montezuma II, last but one of the Aztec Emperors; also the residence of 5 Spanish Governors (from Cortés to Gonzalo de Estrada) of 2 *Audiencias*, of 63 Viceroys (from Don Antonio de Mendoza to O'Donojú), of 1 Mexican Emperor, Yturbide, of 1 foreign Emperor, Maximilian, and of 33 Presidents of the Republic, from General Victoria to General Díaz, the present Chief Magistrate. The architecture of the building is poor and monotonous and nothing remains of its former Aztec splendor. The area occupied by the palace measures 40,000 square meters, thus constituting one of the largest public buildings in the world, and includes the following departments: The Presidential suite of reception rooms; the Ambassadors' room; five Executive Departments (Interior, Foreign Affairs, Treasury, War, and Justice); the General Archives of the Nation; General Postoffice and Engineers' headquarters; the Artillery headquarters; the National Museum and Observatory; the Meteorological Bureau, and others.

The School of Mining and Engineering is another remarkable building, constructed entirely of stone, and dating from the last century. Its façade is Doric and of imposing and severe beauty, while the interior, of the same architectural style, is ornamented with several frescoes by Jimeno. The School of Engineering is now annexed to the School of Mining, and possesses an astronomical and meteorological observatory, a library containing over 6,000 volumes, and cabinets of mineralogy, geology, and paleontology. The Department of Fomento (Promotion) occupies a portion of this building, where it has its own printing establishment.

The National Library was originally built for a church, being dedicated to St. Augustine in 1692, but in 1867 President Juárez devoted it to its present use. It is a massive stone structure of varied architecture and consists of three sections: the main structure, ornamented with the statues of ancient and modern celebrities, is devoted to the reading room; the library proper, containing over 200,000 volumes, and the whole building is surrounded by gardens and inclosed within an iron railing, with stone columns at regular intervals, upon which are erected 20 busts representing as many Mexican celebrities, among others being Tezozomoc and Ixtlilxóchitl, Aztec chroniclers; Netzahualcóyotl, the poet king; Clavijero and Alamán, historians, etc.

The Castle of Chapultepec rises from the top of a hill, west of the city, amid century-old trees and beautiful gardens. Both the castle and the location are full of historic memories. The interior of the structure is tastefully and richly decorated, it being the summer home of the President. Its spacious rooms and galleries contain the finest rugs and Gobelin tapestries, beautiful frescoes in the Pompeian style, and artistic furniture of red African marble. The Military School occupies a portion of this building.

There are many other fine buildings in the city too numerous to mention separately. Among the public monuments are found the statue of Charles IV, the monument to Columbus, the monument to Cuauhtemoc, all on the "Paseo de la Reforma," the richest and most beautiful park in this city.

The principal theaters are the "Teatro Nacional," or opera house, with a seating capacity of 3,000 persons, the "Teatro Principal," a small building, the "Circo Orrín," and others. There are also two bull rings, a race track, etc.

Besides the National Library, already mentioned, the city possesses several others, among which the following may be mentioned: The School of Jurisprudence, 20,000 volumes; the "Cinco de Mayo," 12,000; Preparatory School, 10,000; School of Engineering, 8,000.

The National Museum dates from the eighteenth century and contains many objects of archeological, ethnological, anthropological, and historical value. There are 2 observatories, the National, already

mentioned, and the one belonging to the School of Engineering; a Conservatory of Music, and several scientific associations.

According to the latest available data, there are published in the city of México 33 daily papers and 109 magazines, reviews, weekly and fortnightly publications; 130 in Spanish, 6 in English, 2 in French, 1 in German, and 3 in Spanish and English.

The City of México being both the administrative and the commercial center of the Republic is the focus of all the railways from the States, whose tracks are also used for the service of the District. The National Railway, which connects the Republic with the United States, passes through Tacuba and Atzacapotzalco; the Mexican, connecting the capital with Veraacruz, passes through Los Reyes and the Cuernavaca through several other towns. The steam railroads operating solely within the District are the Tacubaya Railway, connecting with the lines going west to Santa Fé and south to Tizapán, and the Talpam Railway, which goes through Churubusco, San Antonio, Santa Ursula, and Hueypulco. The other important railways of the District are the tramways of the capital, leaving the city about every half hour and connecting it with several adjacent towns. These are the Tlanepautla line, which runs through Tacubaya and Atzacapotzalco; the line to Guadalupe; the line to the Hot Springs of El Peñón; the line of Ixtapalapa, connecting several small towns, and the Chapultepec line, with the railroad of Talpán. There are besides good wagon roads and the Xochimileo Canal, which is the medium of communication by boat. According to the "Guia General," there are in the district about 242 kilometers of railroads in operation, as follows: Standard gauge, 169 kilometers 325 meters, and narrow gauge, 72 kilometers 566 meters. Of these about 116 kilometers are street lines. A tabulated statement published by the same authority shows that from 1873 to December 31, 1897, the traffic over all lines of the District amounted to 244,637,816 passengers, and the gross earnings of the lines are estimated at \$19,828,854, Mexican silver.

As a commercial center the City of México is the richest in the country, possessing wealthy banking institutions, important railroads, telephones, telegraphs, electric light and power plants, manufacturing industries, large buildings devoted to stores and warehouses, and, in short, all the comforts and conveniences to be found in any large city.

The principal banking institutions of the capital are the "Banco Nacional de México," with a capital of \$20,000,000; the "Internacional Hipotecario," \$5,000,000, and the "Londres y México," \$10,000,000. Both the "Nacional" and the "Londres y México" have branches in several of the States. There are, besides, other banking houses doing business with all the large commercial centers in the country and abroad.

There are several manufacturing industries established in the capi

tal, including wine and liquor distilleries, factories for pottery, tobacco, carriages, wagons, cardboard and paper, matches (wax and wooden), glue, chocolate, artificial ice, gloves, glass, cotton fabrics, knitted goods, soap, blank books, playing cards, furniture, hats, lace, etc.; as well as foundries, breweries, and printing establishments. There are also several life and fire insurance companies, both foreign and national. The city possesses excellent hotels, restaurants, and cafés.

The capital, like many European and American cities, says a Mexican publication,¹ has experienced great difficulty in securing a water supply, and has undertaken works of great importance to obtain the proper amount. When the City of México was known during the time of the Aztecs as the "Nueva Tenoxtitlán," its drinking water was supplied by the spring called "Alberca Chica de Chapultepec." During the colonial period, in 1576, the Santa Fé springs were purchased, which now produce 6,000 liters of water per minute, and in 1786 water was furnished by the Desierto and Leones springs, which now yield 8,000 liters per minute. From that time down to 1888 the city council did not secure any other properties; but in that year it purchased the "Alberca Grande de Chapultepec," which gives 7,000 liters of water per minute. All these acquisitions, however, did not suffice to furnish this necessary element to the city.

In 1896 the city council, fearing a water famine, acquired a water supply from the Hacienda de los Morales, which gives 9,000 liters per minute, and also a supply of 800 liters per minute from the Concesión Chousal. Lastly, in 1899-1900, a supply has been secured from Río Hondo, which, united to that from Morales, produces 30,000 liters per minute. When advantage can be taken of all these, the city will have a supply of 55,000 liters per minute, representing a total of 79,200 cubic meters in twenty-four hours, which, distributed among 400,000 inhabitants, will give each individual 198 liters in that time. This will give a larger supply to the inhabitants of México than is enjoyed by the population of London, Berlin, Brussels, and even some cities of the United States, like New Orleans, where each inhabitant only has 140 liters per day. And if to the said amount of 55,000 liters there be added 14,000 liters per minute, flowing from the 1,039 artesian wells recorded in the proper office, there will result a total distribution of about 250 liters per day per inhabitant.

The present difficulty consists in that the distribution is by no means uniform. In the First Ward, with 41,000 inhabitants, each one receives but 77 liters per day, while in the Eighth Ward, with a population of 9,000, each resident receives 219 liters per day. There are at present 6,630 houses, according to official statistics, supplied with water, and the city has 100 kilometers of pipes of different dimensions to carry

¹"El Imparcial," Ciudad de México, February 24, 1900.

it. The estimates for supplying water to the city for the present year amount to \$405,780, including the \$200,000 expended in acquiring the Morales deposit. The water tax yields \$250,000 annually to the city coffers.

The present director of the city waterworks has presented a new plan to the city council, embracing the following points: Equitable distribution of water; uniformity of pressure throughout the city, so that it may reach the highest stories of houses; making distinctions in the uses to which the liquid is put; the purifying of the water by means of filters, and the construction of new aqueducts. Under the new plan the 12,000 houses in the city can receive water, and by unifying the tax for the service (at present \$30 per year for soft water and \$48 for hard) can secure a revenue of over \$500,000.

CHAPTER VI.

THE STATES.

The State of Aguascalientes, population 104,615, whose capital city bears the same name, is situated in the Central Plateau, and, though one of the smallest States in the Republic, is also one of the richest, as it contains within its territory an agricultural region of great promise, and belongs, by reason of its altitude, to the Mexican temperate zone. It is bounded on the north, west, and northeast by the State of Zacatecas, which almost surrounds Aguascalientes, with the exception of a small section to the south, southeast, and east, where the State of Jalisco joins it. The total area of the State measures 7,644 square kilometers.

Owing to its situation on the Central Plateau, Aguascalientes occupies a beautiful and fertile region, which is cultivated almost in its entirety, the western and central portions being irrigated by a number of rivers and brooks, while the eastern portion owes its development to the industry of the farming population. The eastern and southeastern portions are occupied by the extensive plains of Tecuán, which, though containing a large number of *haciendas* (plantations) and *ranchos* (cattle ranches), are lacking in water courses. The fertile valley of Aguascalientes, irrigated by a river of the same name, lies to the northeast, while the no less fertile valley of San Jacinto is further north.

The cold region of the State lies to the northeast, where the mountain chains of Asientos and Tepezalá rise to a height of 2,414 meters. The remainder of the territory, with the exception of a small section in the southwest belonging to the hot zone, is in the temperate region. Almost all the western and northern portions of the State are mountainous, being traversed by the Sierra Fria, and in the southwest are the mountains of the Sierra del Laurel. A number of plateaus and isolated hills and a few chains of mountains rise in the center of the State, so that the mean altitude is from 1,000 to 2,000 meters above sea level, excepting in the sections occupied by the Sierra Fria and the Sierra del Laurel, where the elevation varies from 2,000 to 3,000 meters.

As has been stated, the irrigation of the western and central portions of the State, by reason of numerous rivers and brooks, is of the finest order, but in the eastern part rain and artesian-well waters are alone available for this purpose. The principal river, the San Pedro,

Aguascalientes, or Rio Grande, has its head waters south of the Zacatecas Mountain chain and enters the State on the north, and after traversing its entire extent from north to south enters the State of Jalisco. Other rivers are the Pabellón, Santiago, Morecinique, Chicalote, Labor Tejas, Calvillo, and Tepezalilla. There are also several lagoons or swamps, which are of little importance.

The rainfall throughout the State is moderate except on the eastern plains. Frost is frequent both in the highest regions and in the Sierras, notably in the Partido de Asientos, while in Calvillo it occurs rarely. The prevailing winds blow from the west, northwest, and north. The climate is rather unhealthy, typhus and malarial fevers and affections of the respiratory organs being the most common ailments.

Aguascalientes (literally hot waters) derives its name from the several hot springs found within its limits, the principal ones being those in the capital of the State, San Nicolás de la Cantera, Ojo Caliente, Ojo Calientillo, and Colomo. The temperature of the waters in the several springs varies from 30° to 40.50° C. (86° to 105° F.).

The fauna of Aguascalientes embraces over 27 classes of mammals, 58 species of birds, 9 reptiles, 5 batrachians, 4 fishes, and 74 insects. The flora embraces over 137 species of wild trees, while there are over 48 kinds of fruits; among others, 20 varieties of pears, figs, several kinds of grapes, 11 textile plants, several classes of tanning barks, leaves, and roots, oleaginous seeds or berries, dye plants, forage plants, poisonous and aromatic plants, gums and resins, 103 medicinal plants, and numberless ornamental shrubs and flowers.

The principal industries of the State are agriculture, stock raising, commerce, and mining. Almost its entire extent is under cultivation, the principal products being cereals of all kinds, fruits of every variety, and leguminous plants. Such products as the almond, cotton, citron, sugar cane, mangrove, and other tropical plants and trees would thrive.

Stock raising is carried on to some extent, and, while no statistical data in regard to the number and species of live stock can be obtained, the following official figures for 1897, taken from the Anuario Estadístico, may give an idea of the extent of the industry: In that year there were slaughtered for consumption in the State 5,664 head of cattle, 13,914 sheep, and 4,124 hogs, valued at \$136.894 silver.

Mining, which should be one of the main sources of wealth in the State, has been almost abandoned. The principal minerals found are copper, lead, silver, and magistral,¹ the former most abundant at Asientos and the latter at Tepezalá. The mining district, 63 kilometers northeast of Aguascalientes, is formed by a group of isolated mountains, whose highest points are the Altamira range and San Juan, Las Pilas or Calavera.

¹ *Magistral* is a species of copper pyrites absolutely necessary for the so-called "patio process."

The State of Aguascalientes is an important commercial center, exporting large quantities of corn and beans, especially to the City of México; flour and magistral to several mining districts (Zacatecas, Pachuca, Guanajuato, and other places in San Luis Potosí); cattle, horses, and mules to several points in the Republic, as well as fruits, lumber and timber, hides and skins, tallow, horns, etc. The State imports from the City of México and from Europe and the United States, through the ports of Tampico and Veracruz, groceries, ready-made clothing, cotton, wool and silk fabrics, hardware, drugs, books, paper, chemical products, perfumery, arms and ammunition, furniture, glassware, wines and liquors, hats and bonnets, canned goods, jewelry, machinery and tools for agricultural, mining, and industrial purposes, carriages, etc. The total value of the trade of the State is estimated at about \$7,500,000 per annum, divided as follows: Imports, \$2,500,000; exports, \$3,000,000; local trade, \$2,000,000. The principal markets in the State are Aguascalientes, Rincón de Romos, and Calvillo.

The Mexican Central Railroad crosses the State in two directions, from south to north the line from México to Ciudad Juárez, and from south to northeast the line from Aguascalientes to San Luis Potosí. The principal stations on the former line are Peñuelas, Aguascalientes, Chicalote, Las Animas, Pabellón, Rincón de Romos, and Soledad; and on the latter, Aguascalientes, Chicalote, Cañada, Gallardo, El Tule, and San Gil. The State is in telegraphic and mail communication with the rest of the Republic, and the telephonic service is good and quite extensive. There are good wagon roads connecting the capital with the most important markets of the neighboring States.

The State is divided politically into four *partidos* subdivided into eight municipalities. The *partidos* are the following:

Rincón de Romos or Victoria de Calpulápm, population 13,588, whose chief town, situated on the Mexican Canal, 43 kilometers distant from the capital, bears the same name.

Ocampo or Asientos, population 15,272, chief town Asientos de Ibarra, 10 kilometers from San Gil, on the Mexican Central.

Calvillo, population 10,679, chief town bearing the same name, 627 kilometers distant from México City and 59 from Aguascalientes.

Aguascalientes, population 65,076, its chief town, Aguascalientes, contains 30,872 inhabitants, and is the capital of the State. It is situated on the Mexican Canal, 586 kilometers from the city of México. Among the manufacturing industries of these partidos the principal ones are as follows: Cotton mills, tobacco factories, pottery works, tanneries, wagon factories, and wine and liquor distilleries.

In the city of Aguascalientes there are two lines of tramways; telegraph, telephone, and post offices, schools, hospitals, public libraries, etc., while all the principal towns in the State have similar institutions.

Campeche, population 88,302, with a capital city of the same name,

lies to the southeast of the City of México, occupying the western portion of the beautiful and warm peninsula of Yucatán. Its borders are bathed by the waters of the Gulf of México on the west and northeast, while Yucatán lies to the north and east, the Republic of Guatemala to the southeast and south, and the State of Tabasco to the south and southwest. It occupies a large territory, the climate of which is deadly in many sections, especially in the region of the southern plains. The area of the State is 46,855 square kilometers. From northwest to southeast the Sierra Alta crosses the territory until it meets the Sierra Baja, extending to the northwest of Yucatán. With the exception of this mountainous section, the State is a plain, occupied throughout its greatest extent by forests containing the campeche or logwood and other valuable woods. A portion of the southern region, contiguous to Guatemala, is little known and almost uninhabited, as it contains large savannahs, swampy lands, and impenetrable forests. The richest section of the State is occupied by the Partido del Carmen. It is well irrigated by both large and small streams, which empty into the numerous lakes and lagoons surrounding the Lake of Términos. The shores of the lakes and rivers are covered with forests containing dyewoods, hard woods, palm trees, etc. These waterways are the means of outlet for the trade in woods, which owes its development to the flourishing port of El Carmen or Laguna, opposite Laguna de Términos which is, perhaps, the best harbor of the Mexican Gulf. Campeche scarcely ranking as such.

The climate of the State is hot and unhealthy and the rainfall is moderate, except in Partido del Carmen. Frosts are unknown, and, owing to the swampy and marshy condition of the land, malarial fevers are very common. The Sound or Bay of Campeche extends along the coast of the State, forming many estuaries, points, bars, and some islands. The coast line is low, sheltered, and, in some places, muddy. Coral reefs and other calcareous banks are abundant. This bay, which is an inlet from the Gulf of México, has an area of over 6,000 square miles.

The Banks of Yucatán, an enormous shoal extending along the coast of Yucatán opposite the Campeche coast, as far as its Tabasco boundary on the west, have, according to soundings made by Mexican, American, and English sailors, a depth of 5 fathoms at a distance of from 5 to 7 miles from the shore; of 10 fathoms from 20 to 35 miles, and a depth of 20 fathoms as far as a 60-mile limit WNW. off Punta Palmas, and almost an equal distance to the south, and of 30 fathoms for a few miles along the western limit of the soundings. Beyond this the depth falls abruptly to 40 fathoms. Hydrographic charts prepared by American and English experts show the main irregularities and dangers to be encountered in the Sound of Campeche.

The northern portion of the State, occupied by the partidos of

Hecelehakán, Campeche, and Bolonchén, lacks water courses, the region being fertilized by the rains, temporary brooks, and wells (called *chenes*) used for storing the rain waters. The southern portion of the State is well irrigated, especially the partidos of Carmen and Champotón. The principal river is the Sabancuy, which might properly be called an estuary, being 92.50 kilometers in length and from 400 to 700 meters in width, lying to the northeast of the Partido del Carmen, navigable for small craft and emptying into the Lake of Términos. The bottom of this river is full of oyster beds. The river Marmantel rises in the Partido Champotón, traverses the Partido del Carmen from the southeast to the northwest, and empties into Lake Palao, with a total length of 98 kilometers. It is navigable for a distance of 39 kilometers, and passes through forests of dyewoods and valuable timbers and cultivated lands. For a distance of 16 kilometers from its mouth the river measures 258 meters; thence its width is 25 meters up to the twenty-eighth kilometer, gradually narrowing to 4 meters at Pital and growing smaller and smaller toward its head waters. The Candelaria, which is the largest river in the State, is supposed to have its head waters in Guatemala, and after traversing the State of Yucatán enters Campeche, irrigating the southern portion of the Partido de Champotón, thence running from east to west, and finally emptying into the Lake of Términos. Its length is about 419 kilometers and its width varies from 125 to 175 meters at a distance of 10 kilometers from its mouth to about 51 or 52 meters, with a depth of from 8 to 60 feet. It is navigable for a short distance only, on account of its precipitous course. The Chumpán, 95 kilometers in length, is navigable for small craft, its width varying from 62 to 84 meters and its depth from 12 to 24 meters, according to the season. It is a confluent of Lake Términos. The Palizada is also one of the largest rivers in the State. It rises in the State of Tabasco, enters the State of Campeche on the southwest, traverses it for a distance of 123 kilometers, from southeast to northwest, and empties into Lake Términos, forming the Boca Chica Bar. The Palizada is navigable for craft from 15 to 50 tons burden throughout almost its entire course, being 68 feet in depth, and having a mean width of from 60 to 66 meters. The Champotón, another river of importance, is navigable throughout its course, which is a very sinuous one. There are other rivers and streams of lesser importance.

The Lake of Términos is the most important in the State. Its shores are muddy and shallow. It communicates with the sea by means of two channels, the Principal and the Puerto Real. The tides in this lake are very irregular, the greatest height during the syzygies being 2 feet. Other smaller lakes are San Carlos, Laguna Larga, Colorada el Corte, and a few small lagoons.

The fauna of the State is rich and varied, though not very well

known. There are about 50 species of mammals, 70 varieties of birds, 40 reptiles, 8 batrachians, 40 fishes, 75 insects, and many varieties of crustaceans, mollusks, etc. The flora embraces over 150 species of wild trees, 50 fruits, 28 textile plants, 20 classes of leaves, roots, and barks for tanning purposes, 16 oleaginous seeds, 24 dyewoods, 10 forage plants, 7 poisonous plants, 21 aromatic, and a great number of medicinal plants, several gums and resins, and countless flowers and ornamental plants.

The principal industries are: The exploitation of cabinet woods, and the campeche or logwood (of first importance), commerce by land and sea, agriculture, stock raising, fisheries, exploitation of the salt deposits, extraction of the heniqué fiber and its manufacture into hammocks, ropes, mats, etc.

According to Mexican official statistics, during the year 1897 the State of Campeche produced 3,220,000 kilograms of Brazil wood, valued at \$105,294; 38,569,970 kilograms of logwood, valued at \$877,949; 1,000,000 kilograms of mahogany, and a little over the same quantity of cedar, valued at \$50,000.

Agriculture is one of the leading industries of the State, which possesses fertile lands well adapted to the cultivation of the fruits of the hot and temperate zones. Rice, sugar cane, cotton, and similar products might be advantageously cultivated in the southern part of the State, which is well irrigated, but the inhabitants devote their attention mainly to the exploitation of logwood and valuable timbers. According to the Anuario Estadístico for 1897, there were in Campeche 219 plantations, classified as follows: Sugar cane, 28; cereals, 30; heniqué, 47; woods, 56; tobacco, 4; and stock raising, 54. The only available data in reference to the last-named industry are the statement that in 1897 there were slaughtered for consumption in the State 4,430 head of cattle and 2,167 hogs.

The principal mineral wealth of the State lies in its salt deposits, extending from the port of Celestun (State of Yucatán) to the port of Campeche. The annual yield is estimated at 40,000 to 50,000 *fanegas*, exported to the States of Tabasco, Veracruz, Tamaulipas, Hidalgo, Puebla, and Oaxaca.

The State maintains an active commerce with Europe and the United States, mainly in logwood and cabinet woods, the home trade being restricted to the salt exports (as above noted), shell products, palm hats, hammocks, etc., to the City of México, and the importation of cattle and cereals in limited quantities. When, on account of the lack of rain, there is a scarcity of corn, this grain, as well as other products, is imported from the United States. The principal mercantile centers are Campeche, Carmen, Calkiní, Hecelchakán and Bolonchenticul.

The cabinet woods of the State are exported mainly to the United

States and to Great Britain, the dyewoods to Great Britain, Germany, the United States, and France. Other exports are: Rubber, hair, cocoanuts, chicle, henequén, prepared hides and skins, etc. This commerce may be estimated at about \$1,250,000, silver, per annum. The imports embrace cotton, wool, silk, and linen fabrics; groceries, hardware, drugs and chemical products, paper, books, machinery, tools, agricultural implements, arms and ammunition, cereals, cattle, wines and liquors, etc. This trade is valued at about \$500,000 annually. The total number of vessels entering the port of Carmen in 1897 was, according to official figures, as follows: Steamers, 135; sailing vessels, 203, of which 76 were foreign and the rest Mexican; while 817 touched at Campeche, there being 241 steam and 576 sailing vessels classified as 155 foreign and 662 Mexican. Three hundred and ninety-five and 853 sailed from Carmen and Campeche, respectively, divided as follows: Carmen, 189 steam and 206 sailing vessels, 146 foreign and 249 national; Campeche, 256 steam and 597 sailing vessels, of which 696 were national and 157 foreign. There are custom-houses both at Carmen and Campeche.

The development of railroad traffic in Campeche is very small, due to the fact that the rivers are used as a means of communication with the interior and also that the principal towns are all situated on the sea coast. The railroad between Campeche and Mérida is being exploited in sections, and between Campeche and Lerma there is a street railroad 7 kilometers in length, other lines being in operation in the cities of Campeche and Carmen. In the Partido of Champotón there is a railway 40 kilometers in length connecting Ixuchac with Yohaltún. There are also telegraph and telephone lines, mail facilities, and fine wagon roads connecting the principal cities with those of the adjacent States, while steamship lines connect the principal ports with the rest of the world.

The State of Campeche is divided into five partidos, which are subdivided into municipalities.

The Partido of Hecelchakán, population 22,511, has for its chief town a city of the same name, situated on the railway between Campeche and Mérida, 38 kilometers northeast from Campeche.

Campeche, population 23,651, is the smallest, but also the richest, of the five partidos, the chief town of which, Campeche de Baranda, population 16,647, is also the capital of the State. It is situated on the Gulf of México, 1,320 kilometers from México City, 930 from Veracruz, and 164 from Mérida. This city is the second in importance on the peninsula of Yucatán and is one of the richest and most beautiful on the Gulf. The Campeche wharf is 150 feet long, but owing to the fact that the depth of the harbor is only about 10 feet, heavily laden ships can not anchor there. Among the principal buildings are the City Hall, the Government Building, the hospital, a theater, the market,

and several churches. There are also a fine park and public gardens, schools, and colleges, with a public library containing 3,600 volumes and a museum of natural history and an archæological museum. The leading industries of the partidos are commerce, agriculture, fisheries, the exploitation of the salt deposits, etc. An active commerce is maintained with the Mexican ports of Veracruz, Frontera, Carmen, and Progreso, and also with the ports of Havre, New York, and Santander, the main exports being hemp, dyewoods, salt, etc. In the city of Campeche are two street railway lines, measuring 2 kilometers and 2.8 kilometers, respectively, and from that point are lines running to Lerma and Mérida, the former being 6 kilometers in length and the latter 53 kilometers. The following lines of steamers touch at Campeche: New York and Cuba Mail Steamship Company, from New York; the Harrison Line, from Liverpool and New Orleans; Romano & Co. (Mexican), from home ports, and the Transatlántica Española, from Barcelona, Spain.

The partido de Champotón, population 6,596, has a town of the same name for its industrial center, situated on the Gulf of México, 60 kilometers southwest of Campeche.

The partido de El Carmen, population 15,345, with a principal town and port of the same name, situated 1,152 kilometers from México City, and 168 kilometers from Campeche, comprises one of the richest and most important sections of the State, being celebrated for its dye and precious woods. There are several lakes in the partido, and it is said that the harbor of Carmen is the best on the Mexican Gulf. The commercial movement is estimated at about \$1,500,000 per annum, as it is the port of departure for the exports of forest products for the entire State.

Partido of Bolonchén or Los Chenes, population 5,199, has for its principal town Bolonchenticul, situated 62 kilometers east of Campeche. The celebrated cavern of Bolonchenticul is found 2 kilometers west of the city. In it are seven wells, from which the people obtain their water supply when the public wells fail, respectively called in the Maya language, *Chac-ha* (red water), on account of the color; *Puxalhá* (escaping water), because of the ebb and flow of the well, the waters receding at certain periods; *Sayab* (spring water); *Akab-há* (dark waters), because of the obscurity of the place; *Choco-há* (hot water); *Oxil-há* (milk water); and *Chimez-há* (insect water), because of the insect *chimez* which abounds in great numbers at the well. The cave is entered by means of ladders made of branches of trees, and its depth, to the first well, has been estimated at 1,400 feet.

The State of Chiapas, population 318,599, whose capital is Tuxla Gutierrez, population 10,982, lies to the southeast of México City on the Guatemalan boundary. It is one of the tropical sections and has a great future as an agricultural country, the wealth of its flora being

little short of marvelous. The boundaries are the State of Tabasco on the north, Veracruz and Oaxaca on the west, the Pacific Ocean on the south, and the Republic of Guatemala on the east. Its area is about 70,524 square kilometers.

The southern portion of the State is traversed by the Sierra Madre Range, which is a continuation of the Andes of South and Central America. To the south of this range extends a narrow strip of land, varying from 10 to 39 kilometers in width and reaching to the Pacific Ocean, which forms one of the most fertile regions of the Mexican hot lands, where cacao, coffee, indigo, sugar cane, etc., thrive, and forests of cabinet and dyewoods, medicinal plants, palm trees, mangrove, and timber are abundant. All this section is irrigated by numerous rivers draining into the Pacific from the slopes of the Sierra Madre. The volcano of Tacaná, whose snowy peak is 3,990 meters above the level of the sea, rises in this region, and on its slopes are cultivated potatoes, wheat, and other products of the cold zone. The boundary line between México and Guatemala crosses the top of Tacaná.

The Pacific Ocean bathes the coasts of Chiapas for a distance of 220 kilometers, from its Oaxaca boundary line to the bar of the Sachinate River, on the Guatemalan boundary. The coasts are generally low and sandy and well sheltered, and do not present any obstacles to navigation.

Although the entire territory of Chiapas belongs to the torrid zone, the climate varies according to the altitude, being hot on the coast and the lands irrigated by the Chiapas River; humid and unhealthy on the low marshy lands, especially at Tonala; cold in the valley of San Cristobal, and in the rest of the State it is generally temperate. Rain is abundant, except in the departments of Comitán, Chiapas, La Libertad, and Tuxla Gutierrez.

There are occasional frosts in the valley of San Cristobal, but other sections of the State are rarely if ever visited by them. The winds are very variable. Malarial fevers, typhus, smallpox, and affections of the respiratory and digestive organs are the most common diseases.

The Andes Range from Central America traverses the State, running almost parallel to the coast, at a distance varying from 8 to 39 kilometers. This range is called the Sierra Madre, and from its main line several branches diverge, encompassing the fertile open valleys of Custepeques, Jiguipilas, Zintalapa, and Chiapas, and the inclosed valley of San Cristobal. In addition to the volcano of Tacaná other remarkable mountains are the Tres Picos, north of Tonala, and the Gineta, on the Oaxaca boundary line. There are also the Cungozoe or Plumas and other small ranges.

The eastern plains of Chiapas, known as the "Desierto de los Lacandones," have not yet been thoroughly explored. They are irrigated by the Usumacinta River. To the west of the Chiapas Valley lies that

of Zintalapa, which is a desert tract of land, being an extension of the swampy region south of the Chimalapa Mountains in the State of Oaxaca.

Chiapas is one of the least irrigated sections of the Mexican Republic. The principal river is the Chiapa or Mezcalapa, which has its origin on Guatemalan territory. It enters the State of Chiapas near Amatenango, traverses the central part of the State in a northwesterly direction, and finally empties into the Gulf of México in the vicinity of Frontera (State of Tabasco), having in its entire extent a length of 554 kilometers. It is known by several names in the different parts of its course, irrigates the principal sections of the State, and is the boundary between Chiapas, Veracruz, and Tabasco. This river receives the waters of numerous affluents and, on account of the strong currents and the large volume of water contributed by its branches, is navigable throughout a great portion of its extent. The Usumacinta River, which irrigates the northwestern section of the State, rises in Guatemala, between which Republic and Chiapas it forms the boundary line. Its many branches are navigable throughout, and serve as irrigating streams for the "lacandones" land and the States of Campeche and Tabasco. Its final outlet is into the Gulf of México, after a course of 550 kilometers. The two rivers above named constitute the hydrographic system of the State, the Chiapas traversing it for a distance of 390 kilometers, while the other rivers and streams are of minor importance.

The Lake of Chiapas or Tepancuapan, situated 45 kilometers west of the city of Comitán, 1,447 meters above the level of the Pacific Ocean, belongs to the fluvial system of the Usumacinta River. Its extent is 11 kilometers east and west and 5 kilometers north and south. It contains an abundance of fish. This is also the case in regard to the Lake of Islotes, which lies in the immediate vicinity. Other lakes, and many of lesser importance, are the Catamayá and Jumajab.

The fauna of the State is rich and varied, embracing 60 species of mammals, 100 birds, 40 reptiles, 9 batrachians, 40 fishes, and numberless insects, myriapoda, crustaceans, mollusks, corals, sponges, etc. The cochineal (*coccus cacti*) is most abundant, as is also the mollusk called *Aplisia depilans*, used by the Indians as a dye substance. This is said to be the same dye known to the ancients as *lepus marinus*, from which they extracted the purple of Tyre, in Asia Minor.

The flora of the State is equally rich, comprising over 70 classes of cabinet woods, 50 different kinds of timber, 40 varieties of fruits, 30 textile plants, 22 tanning plants, roots, leaves, and barks, 25 oleaginous plants, 36 dyewoods, 15 forage and 15 poisonous plants, 30 gums and resins, and many varieties of medicinal plants and ornamental flowers. The main industries of the State are agriculture and commerce, which occupy the first rank; forest exploitation, stock raising,

and the development of the salt deposits of the coast. Among the principal cultivated products are coffee, cacao, tobacco, sugar cane, and indigo. Mexican official statistics for 1897 give the following figures in regard to the production of these articles for the period to which reference is made:

	Kilograms.	Value.
Coffee.....	2,465,100	\$1,427,258
Cacao.....	144,491	32,256
Tobacco.....	382,001	81,633
Sugar cane and products.....	10,126,998	1,198,420
Indigo.....	18,200	29,765

Romero, in his exhaustive report on Coffee Culture on the Southern Coast of Chiapas,¹ estimated that a coffee plantation in Soconusco would yield in the fifth year, and every year thereafter, a profit of 135.49 per cent on the capital invested during the four first years. Cacao yields four crops a year in the State, the principal crop being in May and the other three in August, November, and February. It also grows wild at the highest altitudes, where it is known under the name of "wild cacao." It is stated that the Soconusco cacao is the best variety obtainable.

The tobacco of Mapaztepel and Simojovel is, according to experts, as good as the product from Tuxla (Veracruz) and Huimanguillo (Tabasco). The indigo from the department of Tonalá is very fine, and is sent abroad almost in its entirety. It is estimated that the production of raw indigo amounts to about 80,000 kilograms per annum, valued at from \$150,000 to \$175,000.

The climate and soil are adapted to the cultivation of fruits of all kinds, the mulberry tree and the vine. Rubber grows wild throughout the State. Stock raising, although immense facilities are afforded by nature, has not been developed to the extent it deserves. There are, however, herds of cattle of all kinds, and the department of Tuxla Gutierrez is noted for the manufacture of round cheeses equal if not superior to the Edam or Holland cheese. The number of cattle slaughtered for home consumption in 1897 amounted to 14,966 head, of which 1,071 were sheep and 21,955 hogs, their total value being fixed at \$1,014,557.

The mining wealth of Chiapas has neither been properly explored nor exploited; the most trustworthy data, however, show that gold and copper are found in certain places in the Sierra Madre range; iron, lead, talcum, and coal in the valley of San Cristobal, and asphalt, sulphur, sulphate of sodium, gypsum, alabaster, nitrate of soda, salt, yellow amber, etc., in various sections. The salt deposits of Tonalá,

¹ Coffee and Rubber Culture in Mexico.—New York, 1898,

Cuztepeques, and Soconusco yield an abundant supply of that mineral, many persons being engaged in developing this source of wealth. It is said that the Sierra Madre range also contains silver, lead, and iron mines.

Chiapas exports to other States of the Republic, to Guatemala, the United States, and Europe. The value of its trade with Guatemala and the States of Tabasco and Oaxaca is estimated at about \$2,000,000 annually, of which about \$800,000 is credited to imports and the rest to exports. To Guatemala is sent cattle of all kinds; to Oaxaca, coffee, tobacco, etc.; to México City, cacao, cheese, and tobacco; to San Francisco, Cal., coffee, indigo, woods, and fruits; to Europe, indigo and minerals. The imports of the State are cotton, woolen, silk, and linen goods, wines and liquors, arms and ammunition, petroleum, canned goods, sewing machines, machinery and agricultural implements, dyes and medicinal products, paper, books, etc. The principal custom-houses are situated at Soconusco and Tonalá.

Three concessions have been granted for the construction of railways through the State: One from San Juan Bautista to El Paso de Tamulté, another from the port of San Benito to Tapachula, and another from the port of Tonalá to Frontera (Tabasco), passing through Tuxla Gutierrez. Only 50 kilometers of the last-named line are in actual operation. There are telegraph and telephone lines, an efficient mail service, and fine wagon roads throughout the State.

The principal manufacturing industries are: The manufacture of the products of sugar cane, such as rum, sugar, molasses, etc.; cheese, hats, mats, cotton and woolen fabrics, cigars, soaps, candles, and the tanning of hides.

The State is divided politically into 11 departments and 101 municipalities. The departments are:

Pichucalco, population 22,709; chief town, Pichucalco, 114 kilometers southwest of San Juan Bautista and 357 kilometers southwest of Frontera (Tabasco).

Simojovel, population, 21,603; chief town, Simojovel, 1,076 kilometers east-southeast of México City, 84 kilometers northwest of San Cristobal, and 172 kilometers southeast of San Juan Bautista.

Palenque, population, 14,881; chief town, Catazajá, 126 and 124 kilometers northwest and northeast of Frontera (Tabasco) and Carmen or Laguna (Campeche); another important town in the department is Palenque, 230 kilometers from San Cristobal and 316 kilometers from Tuxla, its neighborhood being celebrated for the Palenque ruins, which contain remnants of the Maya civilization.

Chilón, population, 31,594; chief town, Ocosingo, 100 kilometers northeast of San Cristobal and 188 kilometers northeast of Tuxla Gutierrez.

Comitán, population, 55,310; chief town, Comitán, 1,337 kilometers

from México City, 84 kilometers from San Cristobal, 88 kilometers from Tuxla, and 19 kilometers from the frontier custom-house of Zapatula; is on the Rio Blanco, and the commercial center of the State.

Socomusco, population, 30,333; chief town, Tapachula, on the Coatán, 1,250 kilometers from México City, 130 kilometers from Quezaltenango (Guatemala); another important town being the port of Soconusco or San Benito, 35 kilometers southwest of Tapachula, the principal traffic of which is carried on with Guatemala, Panamá, and San Francisco, Cal.

Tonalá, population, 10,948; chief town, Tonalá, one of the best ports on the Pacific coast, 200 kilometers from Tuxla Gutierrez and 370 kilometers from San Cristobal (it being the natural port for these two cities), 998 kilometers from México City, 508 kilometers from Oaxaca, and 139 kilometers from Tehuantepec. The railway from Tonalá to Tuxla Gutierrez, San Cristobal, and Frontera starts from this point. The city also has a maritime custom-house and a number of foreign business houses, mainly American and German. It carries on an active trade with San Francisco, Cal., and the ports of Central America. This trade is valued at over \$300,000 annually, of which \$200,000 is credited to exports and the remainder to imports. The Pacific Mail connects the port with other Pacific ports.

Tuxla Gutierrez, population 28,308, chief town, Tuxla Gutierrez. This town is the capital of the State, with 10,982 inhabitants, and lies 5 kilometers from the river Sabinas, 220 kilometers from the port of Tonalá on the Pacific, 170 kilometers from San Cristobal, 344 kilometers from San Juan Bautista, 487 kilometers from Frontera (Tabasco), and 1,115 kilometers from México City. Its climate is temperate and healthy. It is an important commercial and manufacturing center and is soon to be connected with both the Gulf and the Pacific coasts by the Tonalá and Frontera Railway. The principal buildings are the Government Palace, the theater, the high school, and the hospital. Its main industries are tanning, the preparation of indigo, the manufacture of round cheeses, and commerce.

Mexcalapa or Progreso, population 10,288, whose chief town, Copainalá, is 84 kilometers from Tuxla Gutierrez.

Chiapa, population 21,974, the chief town Chiapa de Corzo, being situated 12 kilometers from Tuxla Gutierrez, 85 kilometers from San Cristobal, 232 kilometers from the port of Tonalá, and 1,127 kilometers from México City.

Libertad, population 15,721; its chief town is San Bartolomé de los Llanos, situated in a fertile plain 70 kilometers from the capital of the State and 310 from the port of Tonalá.

San Cristobal or El Centro, population 55,939, whose principal town, San Cristobal de las Casas, was until 1892 the capital of the State

and consequently is one of the most important towns in the department. Among its buildings are the Cathedral, the Old and New Government palaces, the Institute of Arts and Sciences, the Episcopal Palace, the Seminary, the theater, the hospital, and the Public Library, which contains upward of 4,000 volumes. The city is 1,203 kilometers distant from the capital of the Republic, 86 kilometers from the State capital, 370 kilometers from Tonalá, 850 kilometers from Veracruz, by land, 538 kilometers from San José (Guatemala), 736 kilometers from Mérida (Yucatán), and 746 kilometers from Oaxaca. Agriculture, stock raising, and manual industries are the principal sources of wealth of the city and department.

The State of Coahuila, population 241,026, whose capital is Saltillo, population 26,801, is one of the largest, richest, and most fertile regions in the Republic, being also the third largest State. At its northern boundary it connects with the United States, and although its population is at present numerically small it is steadily increasing, owing to the great undeveloped wealth of its territory, which is traversed by five great railroad lines, the International, the Central, the Gulf Line, the National Mexican, and the Northern Mexican.

The boundaries of the State are: On the north, the United States of America, from which it is separated by the Rio Bravo; on the east, the State of Nuevo Leon; on the south, San Luis Potosí and Zacatecas; on the southwest and west, Durango; and on the northwest and west, the State of Chihuahua. Its superficial area, according to data supplied by the State government, is 144,594 kilometers, and according to the "Dirección General de Estadística de la República Mexicana," 164,690 kilometers.

The State, which is very irregular in outline, occupies a territory which, in the north, is a flat table-land, crossed by small ranges of mountains and hills, becoming more broken toward the south. The numerous branches of the Sierra Madre, in the southern and central portions, are very rich in minerals and form the beautiful valleys of Parras, Sobaco, Catarina, San Isidro, San Marcos, Alamo, Santa Rosa, and Hundido. The northern ranges are covered with *zacate*, certain species of the agave plant, and cacti. In the plains extending from the foot of these mountains northward the heat is intense, owing to low altitude and the scarcity of rain. These plains form a desert where the rich coal deposits of the State are found. To the southeast lies the beautiful and rich agricultural region known as the Laguna, said to contain the most fertile soil in the world. The valley of Parras, the foremost viticultural section, is situated in the eastern part of the State. The mountainous region is rich in gold, silver, iron, copper, lead, and other mineral products. The altitude varies from 700 to 5,800 feet above sea level, and with respect to temperature is

divided into the hot lands, embracing the northern portions; the temperate region, which includes the southern portions and the valleys; and the cold region, which is the mountainous section. The climate is not healthy, the most common diseases being malarial fevers, typhus, rheumatism, and affections of the respiratory and digestive organs. Winds are very variable and rains abundant in the districts of Saltillo, Viesca, and Rio Grande; moderate in Parras, and scarce in Monclova and the lowlands. Frost is occasional in the southern portion of the State and very frequent in the Rio Grande section. The principal mountain ranges are in the districts of Rio Grande and Monclova. There are also the Sierra del Carmen or Las Cruces, on the boundary line of the two districts named; the Sierra Madre, in the Saltillo district; the Sierra Paila, in Parras; and Sierra Noas, in Viesca, besides numerous ramifications of the original systems, and small ranges and hills running in all directions. The different ranges run in almost parallel lines, and so close together that their slopes form a number of canyons, of which the principal are San Marcos, Santa Rosa, and El Rosario in the south, and Los Árboles and San Rodrigo in the north.

Owing to the vast area of the State of Coahuila and the paucity of rivers irrigating it, the entire extent has been considered as a sterile country. This is true in a general way, as in many places only natural deposits of rain waters are found; but on the other hand, there are extremely fertile sections, such as the "lagunas" thoroughly irrigated by the Nazas and Aguanaval rivers. The principal water courses are the Rio Bravo, or Rio Grande, forming the boundary line with Texas, which rises in the State of Colorado (United States), enters Mexican territory near Ciudad Juarez, or Paso del Norte, and after traversing a course of over 800 kilometers and receiving many tributaries, finally empties into the Gulf of México. Next in importance is the Sabinas, forming the eastern boundary between the districts of Monclova and Rio Grande, which rises in Sierra del Carmen, passing through San Juan de Salinas and Juarez and enters the State of Nuevo Leon opposite the frontier custom-house of Guerrero, where it forms the Rio Salado, an affluent of the Rio Bravo. Other rivers are the Alamos, Monclova, Patos, Saltillo, Aguanaval, and Nazas, besides their tributaries and a great number of smaller streams. The principal lagoons are the Alamo, or Parras, in the district of Viesca; the Mayán, or Muerta, larger than the former, in the Parras district; the Agua Verde and the Santa María, in the district of Monclova.

The fauna of the State has not been thoroughly studied on account of the great extent of territory and the scarcity of the population, but there are over 40 species of mammals, 70 birds, 16 reptiles, 5 batrachians, 4 fishes, numerous insects, etc.

The flora comprises over 60 varieties of trees indigenous to the cold and temperate regions, and 50 belonging to the hot lands. The prin-

incipal fruits number upward of 40 varieties, notably grapes, both white and purple, suitable for the manufacture of wines, alcohol, and raisins; the Parras district is especially famous for their production. Other fruits are pears, apples, peaches, etc. The number of textile plants is estimated at 15; tanning plants, 13; oleaginous seeds, 10; plants for dyeing purposes, 10; forage plants, 13; poisonous plants, 17; gums and resins, 12; medicinal plants, 70, and over 100 varieties of ornamental plants and flowers.

Agriculture is the principal industry of the State; cotton, corn, wheat, beans, pease, sugar cane, linseed, and about 30 species of leguminous plants being the most common products. Grape culture is attaining greater importance daily, and it is claimed that the product of the district of Parras is sweeter and more delicious than that of California, and equal, if not superior to, the Málaga and Granada varieties. Mexican statistics for 1897 estimate the total production of the State at 1,361,301 kilograms, valued at \$14,872, besides 900 hectoliters of grape alcohol, valued at \$32,400, and 6,000 hectoliters of wine, valued at \$120,000. These figures have reference only to the municipality of Cuatro Ciénegas, in the Monclova district, there being no available data in regard to the district of Parras, whose production can, however, be safely estimated at more than \$1,250,000 per annum. Cotton is another important product, Mexican official figures estimating the State's output in 1897 at 17,968,187 kilograms, valued at \$6,264,632. Ixtle, during the same period, is quoted by the same authority at 6,577,043 kilograms, worth \$2,430,338. There are also other species of textile plants grown. Almost all the plantations in Coahuila are equipped with modern machinery and implements and follow the most advanced systems of cultivation.

One of the greatest sources of wealth is cattle raising, the plains affording excellent pasturage for the stock. Efforts have been made to improve the breeds by crossing the native cattle with fine imported specimens. Several foreign companies have bought lands for cattle breeding.

The mineral wealth of the State remained unrecognized until a few years ago, but its development has since been so steady and rapid that now mining may be said to constitute one of the chief industries. The wealth of Sierra Mojada, Sierra del Carmen, and the valley of Santa Rosa is almost incredible. These mineral regions are in reality immense silver deposits, which, in conjunction with the coal fields of Piedras Negras and Salina Valley, and the agricultural products of the "Laguna," form the foundations of the future wealth of the State. The registered number of mines in Coahuila on the 31st of December, 1897, according to Mexican official figures, amounted to 264, covering an area of 4,513 hectares, the principal minerals being silver, lead, coal, copper, iron, and gold.

Coahuila is one of the most prosperous commercial sections of the Republic, due, mainly, to its railroad system, which affords the necessary facilities for the transportation of the State products, such as cotton, live stock, minerals, wines, etc. The export trade is principally with the United States, the metallic products being forwarded over the Mexican Northern Railway from Sierra Mojada to Escalón, thence on the Mexican Central to Ciudad Juárez. Some coal is exported to the United States through Piedras Negras, the remainder being consumed in the country by such railways as use this fuel. Flour is sent to Nuevo Leon, cotton fabrics to the States of Zacatecas, Jalisco, Durango, México, and Monterey; salt, live stock, wool, and skins to several Mexican States and to Texas; raw cotton, table grapes, cereals, etc., to several neighboring States, and ixtle and its various manufactures to the United States. The commerce of the State is in the hands of Americans, Spaniards, Germans, and Frenchmen. The leading markets are Ciudad Porfirio Díaz or Piedras Negras, a customs port on the American frontier; Saltillo, San Pedro de la Laguna or Colonia, Torreón, Sierra Mojada, Monclova, Parras, and Viesca. According to the "Boletín de Estadística Fiscal," the value of the trade through the city of Porfirio Díaz during the first six months of 1898-99 amounted to \$1,406,505 for imports and \$1,491,056 for exports. The total trade of the State can be estimated from \$11,000,000 to \$12,000,000 silver per annum.

The railway system of the State is probably the best in the Republic. It is traversed by five different lines, as follows:

The Mexican International, from Ciudad Porfirio Díaz, on the banks of the Rio Bravo del Norte, opposite Eagle Pass (Texas), to the city of Durango, capital of the State of the same name, a distance of 869.51 kilometers. Its main tracks are within the territory of Coahuila as far as Torreón, or a length of 616.55 kilometers. This railway system has several branches open to traffic, and others either in process of construction or under survey, namely, from Sabinas to Honda, 19.81 kilometers; from Monclova to Cuatro Ciénegas, 67.15 kilometers; from Hornos to San Pedro, 23.37 kilometers; and from Pedriceña to Velardeña, 9.35 kilometers, this last in the territory of Durango.

The Mexican Central, which crosses the southeastern section of the State in the districts of Viesca and Parras, running in the former district over the tracks of the International from México to Ciudad Juárez and in Parras over its own tracks from Lerdo to San Pedro de la Colonia (La Laguna line). There are several stations, the line, in its course through the State, measuring 178 kilometers from San Isidro to Torreón or Nazas. At the latter place the Central connects with the International Railway. From Lerdo (Durango) starts the branch known as the "La Laguna" line, whose terminal station is San Pedro de la Colonia, the distance between the two points being 63.4 kilo-

meters. The tracks leave the territory of Coahuila after passing the station of Jalisco, and after traversing a section of Durango return to Coahuila beyond the Cañón de Picardías.

The Northern Mexican is essentially for the mining district, and covers a distance of 125 kilometers from Escalón (Chihuahua) to Sierra Mojada.

The Monterey and Gulf Railway runs from Monterey to Treviño or Venadito, a distance of 106 kilometers.

The National Mexican runs from Ventura to La Mariposa, 152 kilometers, passing through Saltillo. In addition there is a line projected to run direct from Monterey (Nuevo Leon) to the city of Porfirio Díaz, and another line is being constructed from Saltillo to Concepción del Oro.

Besides the railroads there are excellent wagon roads as follows: From México City to Saltillo, 925.64 kilometers; Saltillo to Monterey, 105 kilometers; to Zacatecas, 480 kilometers; to Durango, 507 kilometers; to Chihuahua, 909 kilometers; to Zaragoza or Rio Grande and the shores of the Rio Bravo, 500 kilometers; to San Antonio, Tex., 864 kilometers, and from Zaragoza to Sancti Spiritus, Tex., 1,032 kilometers.

The telegraphic network of the State covers an area of about 2,000 kilometers, while telephone lines extend over more than 100 kilometers. The mail service is very efficient.

The principal manufacturing industries are the manufacture of cotton and knitted goods, wines, tanned skins and hides, soap, candles, cheese, shoes, molasses, furniture, pottery, carriages, wagons, and chocolate.

The State of Coahuila is divided into 5 districts, subdivided into 33 municipalities. The districts are as follows.

Monclova, population 12,830; chief town Monclova, on the river of the same name, is situated in the midst of fertile farm lands, on the line of the International Railroad, 238 kilometers southwest of Ciudad Porfirio Díaz; 370 kilometers from Torreón; 1,514 from México City by rail, and 170 kilometers distant from Saltillo. The other leading towns in the district are Muzquis, Cuatro Ciéngas, Sierra Mojada—an important mining town, 420 kilometers from Saltillo, and one of the terminal stations of the Northern Railway, whose exports of lead and iron ores to the United States are estimated at about \$300,000 per annum—and Candela or Romero Rubio. The International and Northern Mexican railways traverse the district, the former running in a southeasterly direction and the latter toward the southwest.

Rio Grande, population 10,288; its chief town, Ciudad Porfirio Díaz (formerly Piedras Negras), is situated 1,752 kilometers from México City, 480 kilometers from Saltillo, and 65 kilometers from Zaragoza. This district is on the boundary line between México and

the State of Texas, and its capital lies directly opposite Eagle Pass, with which it is connected by the great "international bridge" across the Rio Bravo, belonging to the International Railway. It is an iron structure, 539.90 meters in length. The city has five public buildings and is an important customs port. Mexican official figures for the first half of the fiscal year 1898-99 estimate that the value of the foreign trade of the port for that period amounted to \$1,406,505 for imports and \$1,491,056 for exports. Among the other cities of the district are Zaragoza, on the Rio Grande, 65 kilometers from Porfirio Díaz and 44 kilometers north of Saltillo; Guerrero, 562 kilometers from Saltillo and 52 kilometers from Porfirio Díaz; Morelos, Allende, and Nova.

Saltillo, population 34,194; chief town Saltillo, or Leona Vicario, population 26,801 (also the capital of the State), 865 kilometers from México City by the wagon road and 974 by rail, and 479 kilometers from Ciudad Porfirio Díaz, on the International Railway. It is one of the stations of the Mexican National Railroad and is the principal industrial and commercial center of the State. The principal buildings are the government palace, the Zaragoza theater, the municipal palace, the Catholic cathedral, the penitentiary, the hospital, the American consulate, and several others. The State college, called "Atenéo Fuente," has a good museum of natural history, also a small but very fine public library. Saltillo is noted for the manufacture of zarapes (shawls), made of wool, and remarkable not only for the fastness of their colors, but also for tasteful combination, artistic design, and fineness of fabric, some of them being worth as much as \$200 to \$300. Other industries are the manufacture of cotton cloth, knitted goods, and flour. There are several flour mills in the town and six cotton mills, having 7,592 spindles and run by water power. Other leading towns are Ramos Arizpe, 15 kilometers from Saltillo, on the Mexican National Railway; Arteaga, and Patos.

Parras, population 18,213; its principal town, Parras de la Fuente, is situated 126 kilometers from Saltillo and 25 kilometers from the station of Pailas, on the International Railway, with which it is connected by a stage line. This town is located in a very fertile valley, noted for its fruit production, particularly grapes. There are cotton and flour mills and a factory devoted to the preparation of grape wine and grape rum. San Pedro de la Colonia is the second town in the district, situated 250 kilometers from Saltillo and 16 kilometers from the railway. In the town are several cottonseed-oil mills, cotton gins, and a factory for the production of white cotton cloths, colored drills, toweling, etc., which works 14,000 spindles and 350 looms. The Mexican International Railway traverses the district, stopping at seven stations.

Viesca, population 6,720, chief town Viesca, situated 224 kilometers

from Saltillo, 24 kilometers from Hornos, a station on the International Railway, with which it is connected by a stage line, and 73 kilometers from Torreón station. Other leading towns are Matamoros Laguna, 28 kilometers from Torreón station, and Torreón, an important railway station of the Central and the International lines, 1,136 kilometers from México City, 616.55 kilometers from Porfirio Díaz, and 272 kilometers from Saltillo. This town contains a cotton mill and a soap factory. This district is essentially a mining region, and is well supplied with railway facilities, the Mexican Central traversing it from south to northwest, a distance of 178 kilometers, and the International covering an extent of 53.29 kilometers from west to east. The former line has 9 stations and the latter 4.

The State of Colima, population 55,752, capital Colima, population 18,977, is, with the exception of Tlaxcala, the smallest and least populous of the Mexican States. It is situated in a beautiful tropical region with a good coast line on the Pacific. The boundaries are the State of Jalisco on the north, northeast, and west; the State of Michoacán on the east, and the Pacific Ocean on the south. Its area is estimated at 5,928 square kilometers, divided as follows: Mainland, 5,887 square kilometers, and the islands of Revillagigedo, 41 square kilometers.

The northern section of the State, occupied by the slopes of the Colima volcano, constitutes the mountainous part of its territory, the ascent from the coast rising gradually to a height of 1,200 meters. The litoral is washed by the Pacific for an extent of 160 kilometers. It is low and sandy and contains rich salt deposits. The Revillagigedo group, composed of four desert islands of volcanic origin, named Socorro, San Benedicto, Rosa Partida, and Clarión, lies 240 kilometers northwest of Manzanillo. The irrigating streams are the Armería and Coahuayana rivers and their affluents. The former traverses the center of the State from north to south, emptying into the Pacific through the mouth of the Pascuales, after a course of 294 kilometers, its navigable extent only reaching 18 or 20 kilometers from the mouth. The Coahuayana forms the natural boundary line between the States of Michoacán and Colima. In addition to the water courses above-mentioned, there are the lakes of Cuyutlán and Aleuzagüe.

The climate is hot and unhealthy except in the north, where the snow-crowned peak of the Colima modifies the temperature. Rainfall is abundant and the winds in general are from the northeast. Malarial fevers are prevalent in almost all sections.

The fauna of the State, although rich and varied, is little known. There are about 50 species of mammals, over 100 birds, 32 reptiles, 7 batrachians, 50 fishes, and numberless insects of all kinds, besides corals and sponges and 12 species of mollusks. The flora embraces over 170 species of trees, 60 fruits, 25 textiles, 20 tanning plants, 12

oleaginous seeds, 23 dye plants, about 20 forage plants, 9 poisonous plants, 40 aromatic, 100 medicinal, 22 gums and resins, and a great number of ornamental shrubs and flowers.

The principal industries are agriculture, stock raising, and the exploitation of the salt deposits. The fertility of the soil, due to its fine natural irrigation, permits the culture of various products, among others coffee, cacao, tobacco, rice, cotton, indigo, sugar cane, cereals, and leguminous plants. The coffee of Colima is regarded in Germany as the best on the market. Official figures, from Mexican sources, estimate its production in 1897 at 57,700 kilos, valued at \$31,150. In the same year, cacao was quoted at 100 kilos, at \$100; tobacco, 2,300 kilos, at \$1,495; indigo, 10,200 kilos, at \$25,500, and cotton, 29,900 kilos, at \$690. For the development of its agricultural wealth the State is greatly in need of colonists. The mineral wealth lies principally in the salt deposits, which extend all along the coast. There are also mines of silver, gold, copper, and sulphur.

Colima carries on an active trade with the towns south of Jalisco, with Guadalajara, Mazatlán, and other Mexican ports, and with the foreign ports of San Francisco and San Diego (California), also with Germany and the Hawaiian Islands. The maritime trade is conducted through the port of Manzanillo, and consists chiefly of exports of rice, coffee, rubber, fruits, cabinet woods, dyewoods, corn, hides and skins, minerals, etc., the imports being woolen, linen, and silk goods, alimentary products, glassware, arms and ammunition, wines and liquors, etc. Overland traffic is carried on by rail from Manzanillo to Colima, and to Villa Alvarez; in other instances, by wagon roads. The total travel of the State is estimated at a value of about \$2,000,000 per annum.

The railway of the *Compañía Constructora Nacional Mexicana* (Mexican National Railway) crosses the State over the tracks of the International Line from Colima to Manzanillo, a distance of 95 kilometers. A branch from Colima to Guadalajara is in process of construction. Another railroad runs from Colima to Villa Alvarez, 6,000 meters in length, and a tramway 1,100 meters long connects Colima with the railroad stations. Telegraph and telephone service are excellent, and the mail service is very efficient. The "Pacific Mail," the "Red Line," the "Izaguirre," and the Sinaloa and Durango Railroad Company's steamers connect the port of Manzanillo with foreign and domestic ports, while good wagon roads run from Colima to México City and the principal towns of the adjacent States.

Colima is divided into 3 *partidos*, subdivided into 7 municipalities, as follows: Partido del Centro, Partido de Villa Alvarez, and Partido de Calvillo.

The Partido del Centro, population 36,776, embraces the municipalities of Colima, Coquimatlán, and Ixtlahuacán. The principal town of

the municipality of Colima bears the same name, and is the capital of the State. According to the last census, the population of the capital was 18,977 inhabitants. It is situated in a beautiful and fertile valley, which is irrigated by the Colima River, and is one of the handsomest towns on the Pacific coast. The principal buildings are the City Hall, the theater, the Cathedral, a new market house, and the station of the Mexican National Railroad. It is the commercial center of the State, being distant about 915 kilometers from the capital of the Republic, and possesses a street-car line and an electric-lighting system.

Coquimatlán is the chief town of the municipality of the same name, distant about 12 kilometers from Colima, on the Mexican National Railway.

Ixtlahuacán is the principal town of the municipality of that name, and is about 142 kilometers from Colima.

The Partido de Villa Alvarez or Almoloyán, population 12,437, embraces a municipality of the same name and that of Comalá. Almoloyán or Villa Alvarez is the capital of the former, and is 4 kilometers from Colima, with which it is connected by a railway 6 kilometers in length. The chief town of Comalá bears the same name as the municipality, and is 12 kilometers from Colima and 10 from Villa Alvarez.

The Partido de Calvillo, population 6,539, comprises the municipalities of Manzanillo and Tecomán, their chief towns bearing the same names. Tecomán is situated 45 kilometers from Colima, on the Mexican National Railroad. Manzanillo is one of the leading towns of the State, and is situated 861 kilometers from México City, 122 kilometers from Colima, and 374 kilometers from Guadalajara. It has a large, sheltered harbor, the town being built on the isthmus which separates the waters of the port from those of Cuyutlán. It is connected with the capital by the Mexican National Railway, a distance of 94.5 kilometers. The foreign trade of the port is estimated at about \$400,000, divided equally between imports and exports. The Pacific Mail Steamship Company connects it with San Francisco (California) and Panama (Colombia), and the steamers of the "Red" Line, Izaguirre & Co., and of the Sinaloa and Durango Railroad Company transport merchandise between Manzanillo and the home ports. The custom-house of the State is located at Manzanillo.

The State of Durango, population 295,105, with a capital city bearing the same name, is situated north of the torrid zone, on the slopes of the Sierra Madre Mountains. Its boundaries are Chihuahua on the north, Coahuila on the east and southeast, Zacatecas and the Territory of Tepic on the south, and Sinaloa on the west. The area, according to the State government, covers 118,381 square kilometers, while according to the Bureau of Cartography of the Ministry of Promotion it measures but 98,470 square kilometers.

This is one of the largest and richest States in the Republic. The

Sierra Madre Mountains are rich in minerals, while the valleys in the eastern section are well irrigated and fertile. Owing to topographical conditions, the products of the hot, temperate, and cold zones can be cultivated. The western and southern portions are mountainous, being traversed by the Sierra Madre Mountains. The mean altitude varies from 2,500 to 3,500 meters, the highest point being the peak of Muinoxa. The crest of the Sierra Madre is formed by the convergence of several high mountain ranges which rise in the western part of the State, the principal being Copolquina, Topia, Cavelas, Amacuti, Tominil, Muinora, Guanaccoi, and San Juan de Camarones. These mountains are all rich in minerals, mainly gold, silver, and lead. Other mountains are the Mesquital, Oso, Indé, Candela, San Francisco, Cuencamé, and Noas. The principal isolated peaks are Cerro del Mercado, an inexhaustible iron deposit north of the city of Durango; Cerro del Fraile, an extinct volcano; Pichihuatepec, and Pánuco de Avino, which contains an immense silver deposit.

The most important river is the Nazas, in the northern part of the State. It rises on the eastern slope of the Sierra Madre and empties into Habas Lake, after a course of 600 kilometers. Its principal affluents are the Santiago and San Juan rivers, the former traversing an extent of 215 kilometers before its junction with the main stream. The Tunal River rises west of the city of Durango, and after a course of 150 kilometers enters the Territory of Tepic. The Suchil, or Nombre de Dios, an affluent of the Tunal; the Rio Chico, or Alaponeta, and the Aguanaval are the other most important streams. There are also some small lakes, the principal being Colorado, Guatimapé, Ojo de Agua, Sanceda, Indé, Cuencamé, and Atotonileo. Near the city of Durango there is a fine mineral spring, holding in solution a large quantity of iron.

The climatic conditions of the State vary with the respective altitudes of the localities. The western portions, traversed by the Sierra Madre Mountains, are cold; the region of the valleys and plains, extending from the base of the mountains, is temperate, and in some places rather warm, while the Nazas basin is temperate; the pasture lands are exposed to great variations, being extremely cold in winter and very hot in summer. Rainfall is moderate, and frosts are frequent in the mountains. The most common ailments are fevers and affections of the respiratory and digestive organs.

The fauna of the State, although rich and varied, is not well known. The principal species embrace about 40 mammals, 70 birds, 13 reptiles, 7 batrachians, and a large number of insects. The floral varieties are equally numerous, embracing nearly 80 tree families, 50 fruits, 13 textiles, 12 tanning plants, 12 oleaginous plants, 11 dye plants, 10 forage plants, 4 poisonous and 16 aromatic plants, about 20 gums and resins, 30 medicinal plants, and numberless ornamental shrubs and flowers.

The principal industries of the State are agriculture, mining, stock raising, and commerce. The most important agricultural region is included in the partidos of Mapimí, Durango, San Juan del Rio, and Papasquiario, the agricultural products being barley, corn, wheat, cotton, tobacco, fruits, leguminous plants, and sugar cane. Mexican official statistics for 1897 estimate the number of plantations or farms at 196, of which 2 are devoted to the culture of sugar cane, 157 to cereals, 7 to maguey (mescal), 2 to tobacco, and 28 to stock raising. The production of barley was estimated as 6,170 hectoliters, valued at \$19,310; corn, 917,146 hectoliters, at \$2,089; wheat, 9,663,681 hectoliters, at \$602,320; cotton, 5,533,043 kilograms, at \$5,403,373; tobacco, 40,330 kilograms, at \$8,785, and sugar-cane products, 59,826 kilograms, at \$11,908. The grapes of Villa Lerdo and Cuencamé are famous.

The leading stock-raising sections are the partidos of Durango, El Ojo, Cuencamé, Nazas, Indé, and Papasquiario. The number of the stock is estimated approximately at 1,000,000 head.

The mining districts are the partidos of San Dimas, Tamazula, Papasquiario, San Juan del Rio, Durango, and Nombre de Dios; gold, copper, and silver being the leading minerals. According to Mexican official figures, on the 31st of December, 1897, there were 1,331 mining claims registered in Durango, covering an area of 9,117 hectares, 114 being in process of exploitation. The Cerro del Mercado is an inexhaustible iron deposit, 2 kilometers north of Durango, which, according to the opinion of experts, "could supply all the foundries of England for a period of 330 years." Sulphur, rubies, and other valuable deposits are also found.

The partidos of Durango and Mapimí are the commercial centers of the State. An active trade is maintained with the States of Sinaloa, Chihuahua, Jalisco, Zacatecas, and Coahuila; also with the United States and México City. The principal export trade consists in mineral ores (mainly gold, silver, and iron), cereals, cotton, woods, fruits, live stock, hides and skins, wools, tallow, etc., besides cotton and woolen goods to the States of Chihuahua and Zacatecas. Its principal imports are groceries, hardware, silk, cotton, wool and linen goods, machinery, agricultural implements, mining tools, arms and ammunition, etc., the whole trade of the State being estimated at about \$10,000,000 per annum. The principal ports of entry for foreign goods are Mazatlán and the customs posts of Ciudad Porfirio Díaz and Paso del Norte or Ciudad Juárez.

The Mexican International and the Central railroads traverse the State. The former enters through the partido of Mapimí, crosses Cuencamé and Durango, and terminates at the State capital, 879 kilometers from Ciudad Porfirio Díaz (Coahuila). In addition to the main line the road has several branches. The Central Railroad traverses the State on the tracks of the México and Ciudad Juárez line. There

are several concessions for branch lines. The cities of Durango and Villa Lerdo are equipped with street-car systems, and throughout the State are about 300 kilometers of telegraph and 500 kilometers of telephone lines and an efficient mail service. There are also excellent wagons roads leading to the adjacent States and to the City of México.

The principal manufacturing industries are tanning, the manufacture of flour, of ixtle carpets, and rope, and the extraction of fibers; there are also good pottery works, soap and candle factories, foundries, distilleries, and several cotton mills representing a value of over \$500,000.

The State is divided into 13 partidos, subdivided into 49 municipalities. The partidos are as follows:

Tamazula, population 24,305; its principal town, bearing the same name, is situated near the Sinaloa boundary, 423 kilometers from Durango. This partido is rich in minerals.

Papasquiario, population 32,410; its chief town, Santiago Papasquiario, is 423 kilometers from Durango.

Indé, population 13,532, chief town Indé, situated 316 kilometers from Durango, is rich in gold, silver, and copper mines.

Mapimí, population 42,548; its chief town, Villa Lerdo, is the second city in the State, located 263 kilometers from Durango. This is one of the most advanced sections of the State, its agricultural wealth being developed by the most modern methods and representing a value of about \$2,000,000 per annum. It also contains valuable deposits of silver, gold, lead, copper, and sulphur. Villa Lerdo is connected with the station of the Central Railroad by a tramway 4 kilometers in length, and has very fine buildings, including steam flour mills, a foundry, and several other industrial establishments. Mapimí is the next town of importance, situated 511 kilometers from Durango and 25 from the Central Railroad station. This town contains six foundries, a cotton and knit-goods mill, and other industrial establishments.

Cuencamé, population 22,940, chief town of the same name, 168 kilometers from Durango and 12 from the Pasaje station of the International Railway, is an agricultural, stock raising, and mining district.

San Juan de Guadalupe, population 10,605; its chief town, bearing the same name, is situated 300 kilometers from Durango, 35 kilometers from San Isidro, and 30 from the Symon station of the Central Railroad.

Nombre de Dios, population 23,090, the chief town of which, bearing the same name, is situated 67 kilometers from Durango, and has in its vicinity cotton and woolen mills, using the waters of the Suchil River as motive power.

Mezquital, population 6,930; its chief town, Mezquital, is 100 kilometers from Durango.

Durango, population 60,427; its chief town, Durango, population

26,425, is also the capital of the State, and is situated 918 kilometers from México City, 262 from Mazatlán, 688 from Zacatecas, 235 kilometers by rail from the Torreón station of the Central Railroad, and 870 from Ciudad Porfirio Díaz. The city contains many fine buildings, notably the Cathedral, which is considered one of the handsomest in the Republic, the Government Palace, the City Hall, the theater, and the mint, which, according to the "Anuario Estadístico" for 1897, had coined from 1887 to 1895 silver to the amount of \$10,687,462.80, the coinage for 1894-95 amounting to \$1,527,596. Durango has 10 kilometers of city and suburban railroads; electric lighting, cotton and woolen mills, foundries, flour and sugar-cane mills. It also contains two banks, one a branch of the National Bank and the other a bank of issue. Agriculture and stock raising are the principal industries of the partido, mining receiving very little attention. Its trade is very valuable. Several stations of the International Railroad are within its confines.

San Dimas, population 6,487; its chief town, bearing the same name, situated 144 kilometers from Durango, is one of the best-developed mining regions of the Sierra Madre.

El Oro, population 15,899; its chief town, Real, or Santa María del Oro, is situated 311 kilometers from Durango, and is largely interested in the mining of gold, that metal being very abundant in its vicinity.

Nazas, population 19,395; its chief town, bearing the same name, is situated 167 kilometers from Durango.

San Juan del Rio, population 25,573; its chief town is San Juan del Rio, 104 kilometers from Durango.

The State of Guanajuato, population 1,062,554, with a capital of the same name, is one of the most favored regions of the Republic, as it contains immense natural deposits of gold and silver, fertile lands, populous cities, and fine railroads, besides being possessed of a valuable commerce and equipped with almost all the latest improvements of a highly civilized country. The boundaries are: San Luis Potosí on the north, Querétaro on the east, Michoacán on the south, and Jalisco on the west. Its area is 20,276 square kilometers.

The topographical aspect is varied, owing to its situation on the cordillera of the Anahuac, the northeast and central sections being traversed by mountain ranges, while to the west and south extend the rich valleys of San Felipe, San Judas, and Santiago, and the fertile plain of El Bajo. The principal cordilleras traversing the State are the Sierra Gorda, on the northeast, and the Sierra de Guanajuato, in the center, which are formed by the junction of the Codornices, the San Antonio, and the Santa Rosa ranges. The highest peaks in the Guanajuato Mountains are the Gigante, 2,346 meters in height, and the Llanitos, 2,815 meters. Smaller ranges extend in various directions, inclosing the fertile valleys and plains of the State.

The principal rivers are the Lerma, the Laja, and the Turbio, the last two being affluents of the former. The Lerma River rises in the State of México, traverses the State of Guanajuato for a distance of 147 kilometers, and empties into the Pacific Ocean near San Blas, in the Territory of Tepic. The Laja rises in the Sierra de Guanajuato, and after receiving the waters of many affluents and traversing a course of 126 kilometers, empties into the Lerma. The Turbio, or Gomez, waters a territory 113 kilometers in length from its rise in the Sierra de Guanajuato to its junction with the Lerma. This State is also irrigated by the Irapuato River and several smaller streams. The only lake is Yuririapúndaro (lake of blood), which is 97 square kilometers in extent and contains several small islands. Near the valley of Santiago there is a large circular well, known as the Albercas, which is believed to be the crater of an extinct volcano. Its waters are not potable and its depth has never been ascertained. Mineral springs are abundant.

The climate is temperate and agreeable, except in the higher altitudes of the mountain ranges, the mean temperature being 21° C. (about 70° F.) and the highest 28° C. (82.40° F.) during the hot months. The prevalent diseases are malarial fevers and typhus. During the rainy season the rainfall is heavy in the plains and valleys and moderate in the mountains. This season extends from the middle of May until the beginning of July. The prevailing winds are from the northeast, changing to southeast at the approach of the rainy season.

The fauna of the State is very rich, comprising, in all, 510 species, divided as follows: 41 mammals, 206 birds, 44 reptiles, 15 batrachians, 7 fishes, and 148 insects. The flora is no less rich, embracing over 23 kinds of wood, 44 fruit trees and plants, 32 textiles, 11 tanning plants, 15 oleaginous plants, 16 dyewoods, about 80 medicinal plants, 12 forage plants, 18 aromatic plants, 15 gums and resins, and numberless ornamental flowers and shrubs.

According to the location of the partidos, the leading industries are mining, agriculture, and cattle raising, the former taking first rank in Guanajuato, La Luz, Bietona, and San Felipe, and agriculture and stock raising in the plains and valleys. The principal agricultural products are cereals and leguminous plants of all kinds, fruits, chile, alfalfa, and canary seed, valued at about \$21,000,000 per annum, besides which tobacco and zacatón receive considerable attention. According to Mexican official figures there are in the State 394 plantations or haciendas, of which 346 are devoted to the culture of cereals. In 1897 the value of corn, wheat, and barley products was as follows, in round numbers: Corn, 4,000,000 kilograms, \$7,000,000; barley, 100,000 kilograms, \$190,000; and wheat, 55,300,000 kilograms, \$5,000,000. Chile is quoted at 1,500,000 kilograms, worth \$490,000, and tobacco at 100,000 kilograms, valued at \$32,000.

The total value of the stock-raising industry, comprising in all about 1,000,000 head, is estimated at \$10,000,000, hogs, sheep, and goats forming the principal elements. The annual production of wool is calculated at 200,000 kilograms, worth \$80,000.

The State of Guanajuato is one of the richest mineral regions in the world. The mining region follows the line of the angle formed by the Sierra Gorda and Sierra de Guanajuato, there being in all five mining districts, as follows: Sierra Gorda, Allende, Santa Cruz, Guanajuato, and Leon. According to the *Geografía y Estadística*, by Velasco (1890), there were 273 mines, as follows: 31 silver and gold, 124 silver, 44 mercury or cinnabar, 24 tin, 5 iron, 1 lead, 10 argentiferous lead, 3 copper, 15 argentiferous copper, 5 magistral or sulphide of copper, 1 bismuth, 7 hematite, 1 sulphur, and 1 plastic clay; and according to the *Anuario Estadístico* there were, on the 31st of December, 1897, 550 claims registered, covering an area of 6,518 hectares, of which 80 were in process of development, and whose production amounted to 149,507,042 kilograms, valued at \$9,026,348.

Guanajuato is the most important mercantile center of the Republic, both the Central and Mexican National railways deriving from local traffic greater profits than in any other State. Its total trade can be estimated at \$67,000,000 per annum, divided as follows: Exports of minerals to México City, the United States, and Europe, \$20,000,000; exports of agricultural and other products to home States, \$10,000,000; exports of industrial products, \$2,000,000; imports from México City, United States, and Europe, \$12,000,000; imports from other Mexican States, \$3,000,000, the balance being made up by the local trade. The principal exports are mineral and agricultural products, live stock and cotton goods, while the imports from México City, and the United States and Europe, are groceries, ready-made clothing, textiles, hardware, drugs, arms and ammunition, hats, canned goods, agricultural and mining machinery, and tools; and from the Mexican States, mescal tequila, fruits, pulque, coffee, etc.

The Mexican Central Railroad traverses the State in three directions: First, from east to northwest on the line from México City to Ciudad Juarez or Paso del Norte (152 kilometers); second, from the center to the southwest on the branch line from Irapuato to Guadalajara (84 kilometers); and third, from the center to the northeast on the branch line from Silao to Guanajuato (23 kilometers). The Mexican National Railroad runs from southeast to north on the line from México City to Nuevo Laredo, a distance of 271 kilometers, and the Salamanca and Valle de Santiago Railroad has an extent of 18 to 20 kilometers in the municipality of Salamanca. The street railways in the cities of the State measure about 14 kilometers. The State is

crossed in all directions by good wagon roads, and there exists an extensive network of telegraph and telephone wires as well as an efficient postal service.

Among the flourishing industrial establishments are 350 woolen mills, with a yearly output of 90,000 pieces of cloth; 45,000 yards of carpet and other fabrics; 853 cotton mills producing an average of 200,500 pieces of cotton (manta), 46,600 pieces comboyos, 550,000 rebos, and 100,000 kilograms of twine, the consumption of these factories being about 815,000 kilograms of wool and 1,000,000 kilograms of cotton annually. There are besides 72 flour mills (steam and hydraulic power) yielding about 15,000,000 kilograms of flour per annum, linseed mills, saddleries, potteries, powder works, distilleries, tanneries, and foundries.

The State is divided into 5 departments, subdivided into 31 partidos. The departments are:

Allende, population 161,904 (4 partidos); its principal cities are San Miguel Allende, and Dolores Hidalgo, situated 71 and 66 kilometers, respectively, from Guanajuato.

Celaya, population 277,321 (11 partidos); its principal city bearing the same name, is situated at the intersection of the Mexican National and Mexican Central railways. It has a line of street cars 3 kilometers in length extending to the railway station. Other towns are: Acámbaro, on the Mexican National Railway; Aspaséo, and Salvatierra.

Guanajuato, population 387,718 (9 partidos); its principal city bears the same name, it being also the capital of the State and containing 39,404 inhabitants. The city of Guanajuato is situated 406 kilometers, by rail, from México City; 344 from San Luis Potosí; 160 from Querétaro; and 212 kilometers from Guadalajara. It is located in a narrow valley on the river Guanajuato. The principal buildings are the State government palace, the Palace of Congress, the mint, the State college, several churches, two theaters, hospitals, a bull ring, the market de la Reforma, the Pantheon, and the Castle of Granaditas, where the heads of Hidalgo, Allende, Aldama, Jimenez, and other patriots were hung on iron hooks during the war of independence.

The mineral wealth of Guanajuato has always commanded the attention of the world. From 1812 to 1896 the combined value of gold, silver, and copper coined by the Guanajuato mint amounted to \$309,077,468.25, Mexican silver, the gold coinage being estimated at \$21,178,328; silver, \$287,884,476.25, and copper, \$14,664. This city is the commercial center of the State, and one of the most important in the Republic. It has a branch road connection with the Central Railroad, also 10 kilometers of street railways, electric lighting, and all modern improvements. Other leading towns are Cuitzé de Abasolo, Irapuato (an important market on the Central Railroad), La

Paz, Salamanca, Silao, and Valle de Santiago, situated in a fertile valley bearing the same name.

Leon, population 142,157 (4 partidos); its two leading towns are Leon de los Aldamas and San Francisco del Rincón, the former 56 kilometers from Guanajuato, and one of the principal manufacturing centers of the Republic, and the latter situated on the Central Railroad.

Sierra Gorda, population 93,456 (3 partidos); its principal cities are San Luis de la Paz, 98 kilometers from Guanajuato, San José de Iturbide, Xichú, Santa Catarina, and Victoria.

The State of Guerrero, population 420,336, its capital Chilpancingo, population 6,312, is one of the maritime States of the Republic. It has a promising future, but so far has been but little explored and has a small population, lacks communication facilities, and its territory is mountainous and rough. The boundaries are the States of México and Morelos on the north; Puebla on the northeast; Oaxaca on the east and southeast, and the Pacific Ocean on the southwest. The area is given as 64,756 square kilometers.

The Pacific coast line of the State is 500 kilometers in extent, the shores being low, sandy, well sheltered, and possessing excellent ports and harbors. Acapulco, the principal port of the State, is classed among the finest harbors of the world, by reason of its beautiful, well sheltered bay, measuring 6,285 meters in length by 3,141 in breadth, and having a depth of 84 meters. Other Pacific ports in the State are Petlacala, Sihuatanajo, and Papanao.

Guerrero is mountainous throughout almost its entire extent, being traversed by the Sierra Madre del Sur, which reaches its greatest altitude at 2,800 meters. The valleys between the cordilleras are narrow, and the highest peaks are Tlacotepec and Tiotepac, 2,800 meters high, and Escalera, 2,521 meters in height. The rivers of the State, on account of the broken surface of the territory, have very rapid currents. The principal is the Mexcala or Balsas, also known as the Atoyac or Po-blano. Its headwaters are in the Tlaxco Mountains of the State of Tlaxcala, whence it enters Guerrero on the east, dividing the State into two sections, the southern occupied by the Sierra Madre range and the northern by the slopes of the mountain chains from the States of México and Morelos. The river is 687 kilometers in length, but is navigable for small craft only. All the waters of the State are tributary to it. The principal lakes are Pazahualeco, Chantengo, Nexpa, and San Marcos.

Climatic conditions vary according to the altitude of the districts, the cold belt beginning beyond 2,000 meters, the temperate lying between 1,000 and 2,000 meters, and the hot lands situated below the 1,000 meters. On the coasts the heat is excessive, from 35° to 36° C. (95° to 96°.80 F.), and the rain falls in torrents, precipitation being moderate in the temperate lands only. Frosts are frequent in the

high altitudes of the Sierras. Fevers, leprosy, and affections of the respiratory and digestive organs are the prevailing diseases.

The fauna of the State, though rich and varied, is not well known. It embraces over 55 species of mammals, over 80 birds, 50 reptiles, 5 batrachians, 40 fishes, and numberless insects. The flora is worthy of note, comprising over 150 trees, 75 fruits, 33 textile plants, 17 tanning plants, 15 oleaginous, 25 dye, 10 forage, and an equal number of poisonous plants, 20 aromatic plants, about 40 gums and resins, 200 medicinal plants, and countless ornamental shrubs and flowers.

The development of the immense agricultural wealth of the State only awaits the establishment of railroad facilities, immigration, and better wagon roads, when the cultivation of cotton, coffee, tobacco, rubber, vanilla, etc., may be advantageously undertaken on a large scale. The agricultural production of the State is about \$2,200,000 per annum, the leading articles being sesame seed, cereals, leguminous plants, fruits, tobacco, vanilla, coffee, cacao, and textile fibers. In 1897 the number of plantations estimated as under cultivation was 144, as follows: Cotton, 15; coffee, 1; sugar cane, 72; cereals, 25, and 31 cattle ranches; the production of rice being calculated at 238,027 kilograms, valued at \$24,643; corn, 925,743 hectoliters, at \$1,527,008; sugar-cane products, 2,627,537 kilos, at \$175,298; cotton, 4,264,000 kilos, at \$235,900; tobacco, 131,100 kilos, at \$12,004; coffee, 12,150 kilos, at \$7,690, and cacao, 4,215 kilos, at \$4,292. The value of stock may be estimated at about \$3,000,000, and dairy industries are in process of development.

Within the limits of the State lie one of the richest mining regions of the country, although as yet complete development has not been attained. Gold, silver, mercury, lead, iron, coal, sulphur, granite, and marble are among the principal mineral products; also very fine opals, of three varieties, topazes, diamonds, and, according to report, salt. The exploitation of these products has been greatly hampered by lack of communication facilities, less than two-thirds of the total number of mines (estimated at 1,000) being in operation.

The commerce of Guerrero is of little importance, due to the lack of railways and to the paucity of the population, which circumstances may be accounted for on the one hand by the topography of the country and by the unhealthy climate on the other. Exports consist of minerals, live stock, cotton, fruits, and woods, sent to México City; and of hides and skins, cotton, rice, tortoise shell, pearl conches, and fruits sent abroad, while the imports include all kinds of manufactured products, mainly food products, hardware, dry goods, machinery, agricultural implements, etc. There is a maritime custom-house at Acapulco, its trade being approximately estimated at \$500,000, equally divided between imports and exports. The total trade of the State is fixed at about \$5,000,000 in round numbers.

There are practically no railroads, as the Interoceanic Railway, which is destined to connect the port of Acapulco on the Pacific with Veracruz on the Gulf, and with the national capital, is not yet completed, and the same is true of the México Cuernavaca and Pacific, and of the Michoacán and Pacific lines, which are to traverse certain portions of the State. There are, however, extensive telegraph and telephone lines, as well as an efficient mail service and some wagon roads, especial mention being made of a road connecting México City and Acapulco. The port of Acapulco connects with foreign countries by means of the Pacific Mail Steamship Company and the "Compañía Mexicana de Vapores del Pacífico y Golfo de California."

The value of the manufacturing industry of the State, estimated at about \$3,000,000 annually, is confined to the manufacture of sugarcane products, mescal wine, palm oil, cotton spinning, tanning, and the development of apicultural products.

The State is divided into fourteen districts, subdivided into fourteen municipalities. The districts are:

La Unión, population 17,735, with its chief town bearing the same name, situated 566 kilometers from Chilpancingo.

Mina, population 46,650, an important mining section; its principal town, Coyuca de Catalán, is 293 kilometers from Chilpancingo.

Alarcón, population 31,801, rich in minerals and remarkable for the cave of Cacahuamilpa, said to be more beautiful than the Mammoth Cave in the United States. The chief town is Taxco de Alarcón, 147 kilometers from Chilpancingo.

Hidalgo, population 26,672; its chief town, Igualá de Iturbide, is 135 kilometers from Chilpancingo.

Alvarez, population 37,539; chief town, Chilapa de Alvarez, 46 kilometers from Chilpancingo.

Zaragoza, population 18,709; chief town, Huamuxtitlán, 222 kilometers from Chilpancingo, situated in a very fertile region.

Morelos, population 36,042; chief town, Tlapa or Ciudad Comonfort, 168 kilometers from Chilpancingo,

Abasolo, population 24,588; chief town, Ometepepec, 190 kilometers from Chilpancingo.

Allende, population 25,589; chief town, Ayutla de los Libres, 151 kilometers from Chilpancingo.

Tabares, population 32,866; its chief town, Acapulco de Juarez, population 5,780, is an important seaport, 188 kilometers from Chilpancingo and 495 kilometers from México City. The bay of Acapulco is the most sheltered of the Mexican ports, and is capable of accommodating 100 vessels of deep and 200 of lighter draft. The steamers of the Pacific Mail and of the Mexican International Company touch at Acapulco, where there is a custom-house and a beacon light.

Galeana, population 18,694; its principal town, Tecpan de Galeana, located 327 kilometers from Chilpancingo.

Chilpancingo, or Bravos, population 27,631, its principal town, Chilpancingo de los Bravos, or Ciudad Bravos, population 6,321, the capital of the State, is a small but important city, 319 kilometers from México City and 178 from the port of Acapulco. There are some fine buildings in the town, which is lighted by electricity.

Guerrero, population 26,108; its principal town is Tuxtla de Guerrero, 13 kilometers from Chilpancingo.

The State of Hidalgo, population 558,769; its capital city Pachuca, population 40,487, is bounded on the north by the States of San Luis Potosí and Veracruz, on the east by Puebla, on the south by México and Tlaxcala, and on the west by Querétaro, its area measuring 22,300 square kilometers.

The northern portion of the State is mountainous as compared with the southern, the orographic system being a continuation of the Sierra Madre, which receives different names in the various districts traversed, the principal ranges being Tulancingo, Zimapán, Jacala, Zacualtilpam, Hueyutla, and Pachuca. The highest peaks are Tapetillán, Crestón, Cerro Alto, Cresta de Gallo, Organos, and Cerro de Navajas, the latter being 3,212 meters in height. There are several curious caves in the State. The southern and western portions are generally flat, the principal plains being the Apan, Mexquital, Tula, and the valleys of Tulancingo and Agua Zarea, and the Llanura Grande. There are no large rivers, the principal streams being the Tula and its tributaries, the Amajague and its affluents, and the Metztitlán or Rio Grande and its branches. There are other rivers of lesser importance and several waterfalls, among them being the Regla cascade, whose waters are used by the Electric Power Company to supply motive power for several reduction works. The largest lake is the Metztitlán, which is 17 kilometers in length. Mineral springs abound.

The climate is generally mild rather than cold on the uplands and plateaus, and hot or temperate according to the varying altitudes of the lower districts. The fauna and flora are rich and varied, resembling in general characteristics those of the other States of the Republic. The agricultural products consist in the main of cereals, coffee, sugar cane, cotton, tobacco, maguey, and leguminous vegetables. Mexican official statistics for 1897 give the State 208 plantations, divided as follows: Maguey pulque, 129; cereals, 52; sugar cane, 8; tobacco, 1; and 18 cattle ranches. Their production is estimated thus: Cereals, to the value of \$12,521,542; sugar-cane products, 2,322,657 kilograms, valued at \$100,500; rum, 8,620 hectoliters, at \$151,572; and maguey products to a value of \$2,154,815, pulque alone amounting to \$1,934,880.

Mining is the most important industry, as almost every district is a

mining center, the principal being Pachuca and Zimapán, the former containing the regions of Real del Monte, Atotonilco el Chico, Santa Rosa, Capula, Tepenené, and Potosí, and the latter, Cardonal, Bonanza, Pechuga, Jacala, La Encarnación, San José del Oro, and Verdosas. The chief metals found are gold, in small quantities; silver, mercury, copper, iron, lead, zinc, antimony, manganese, cinnabar, and plumbago. Other mineral substances are coal, marble, granite, opals, garnets, etc. There are in operation 36 reduction works for the treatment of the finer metals and 6 devoted to the smelting of iron ore.

The railroad lines traversing the State are the "Hidalgo y del Nordeste," connecting Pachuca with México City (109 kilometers); the Mexican Central and the Mexican International, covering, in all, an extent of 371 kilometers. There is a street-car line in Pachuca, which is 8 kilometers in length, besides several private railways, constructed in connection with the working of the mines. The total length of telegraph wires is estimated at 918 kilometers, with 32 stations. There are also numerous telephone lines and an efficient mail service.

The principal industries are the reduction of ores, the manufacture of cotton and woolen goods, and of pulque, bricks and tiles, matches, etc.

Politically, the State is divided into 15 districts, subdivided into municipalities. The districts and their chief towns are the following:

Atotonilco el Grande, population 27,402; chief town of the same name, 32 kilometers from Pachuca, the capital of the State.

Actopan, population 46,026; chief town Actopan, 30 kilometers from Pachuca.

Apán, population 15,263; chief town Apán, 72 kilometers from Pachuca.

Huichapam, population 30,755, chief town of the same name, 140 kilometers from Pachuca.

Huejutla, population 70,264, chief town Huejutla, 192 kilometers from Pachuca.

Ixmiquilpan, population 48,693, chief town of the same name, 88 kilometers from Pachuca.

Jacala de Ledesma, population 21,920, chief town of the same name, 180 kilometers from Pachuca.

Metztitlán, population 21,743, chief town Metztitlán, 76 kilometers from Pachuca.

Molango, population 32,014, chief town of the same name, 116 kilometers from Pachuca.

Pachuca, population 99,497; its chief town, Pachuca, population 40,487, is also capital of the State. It is the principal city of Hidalgo, on account of its commerce, population, and mining industry. It is connected with México City by the Hidalgo, Mexican, and Central railways. The city contains several fine buildings, among others the

Palace of Justice, the Scientific and Literary Institute, a Meteorological Observatory, the School of Mining, and a public library. In the district of Pachuca are found the principal mining sections of the State.

The other districts are Tula, population 37,631; Tulacingo, population 45,245; Tenango de Doria, population 21,319; Zacuatilpan, population 18,000; Zimapan, population 22,636, their chief towns bearing the names of the districts.

The State of México, population 841,618; capital the city of Toluca, population 23,150, is among the most important agricultural and industrial sections of the Republic. Its territory is not very large, but it is fairly well populated and embraces within its limits such valleys as the Toluca Valley and the valley of México, which are classed among the most beautiful and fertile in the world. Its boundaries are the State of Hidalgo on the north, Tlaxcala and Puebla on the east, Morelos on the south and southeast, Guerrero on the south and southwest, and Michoacán on the west. The Federal District, with a total extent of 26,071 kilometers, lies to the east of the State.

The State occupies one of the most beautiful regions on earth. The northern portion is a plain, intersected by small foothills and covered with salt lakes and marshy lands; this is the land of the cactus and agave. The eastern part is occupied by the Popocatepetl range, fertile lands, snow-covered peaks, smoking volcanoes, and the celebrated valley of Texcoco. The center is the region of forests and mountains, the valley of Toluca occupying the highest plateau. The Sierra Nevada mountain range, with its snow-covered peak of Popocatepetl, the highest in the country, rising 5,400 meters above sea level, traverses the eastern section; to the north is Ixtacihuatl, 4,786 meters in height; and to the south runs the Ajusco range, which marks the limit of the valley of México, its highest peak is Ajusco, 4,153 meters high. The Sierra de Guadalupe lies north of the Federal District, and to the northwest of the Ajusco range is the snow-capped volcano of Toluca or Xinantecatli, 4,476 meters above the level of the sea, in whose crater are two lakes of potable water. The valley of Toluca is a beautiful spot, more than 2,000 meters above sea level, being situated on the highest plateau of the Republic and embracing within its limits the Federal District and the City of México, capital of the Republic.

The State is divided into two hygrographic basins—the valley of México and the basin of the Lerma River, the latter extending to the States of Querétaro, Michoacán, and Guanajuato. The Lerma is by far the most important stream of the country, traversing an extent of 452 kilometers from its source to its mouth in the Chapala Lake. Next in importance is the Cuautitlán or Desagüe River; following, according to rank, the Tula, the Tajo de Nochistango.

This valley also contains five important lakes, three of which lie wholly within its boundaries, viz, Zumpango, San Cristobal, and Xaltocán, while the Texcoco and Chalco extend into other States. The Lerma lagoon lies wholly within the State.

Climatological conditions vary according to altitudes. In the valley of Toluca, 3,176 meters above sea level, it is exceedingly cold, while the valley of México enjoys a temperate and healthy climate, although it is somewhat variable. The rainfall is uncertain—scarce at times and then again falling abundantly. Frost is not frequent.

Both fauna and flora are extremely rich, embracing as many species as the most favored States. The principal agricultural products are cereals, leguminous plants, and spices. Besides these there are rice, coffee, sugar cane, linseed, tobacco, and the maguey plant. The total production varies in value from ten to twelve millions of pesos per annum. The latest available Mexican statistics (1897) credit the State with 336 haciendas, divided as follows: Sugar cane, 17; cereals, 240; maguey pulque, 60, and stock raising, 19. The total value of cereals in that year amounted to \$7,437,373; sugar-cane products (direct), 791,069 kilograms, valued at \$89,680; sugar-cane rum, 4,181 hectoliters, at \$149,150; pulque, 1,059,338 hectoliters, at \$1,784,249; *tlachique*, 2,068,186 hectoliters, at \$1,854,285; coffee, 59,930 kilograms at \$34,377, and tobacco, 4,294 kilograms, at \$3,124.

Stock raising is also one of the principal sources of wealth, with an estimated value of \$17,000,000, with the following relative rank: Sheep, cattle, hogs, goats, horses, asses, and mules.

Many rich mining districts are within the State, though their wealth is not yet fully exploited. Gold, silver, and lead are the principal metals. On December 31, 1897, there were registered 218 claims, covering 2,585 hectares, and 33 mining plants, of which 11 were being worked.

Annual trade may be safely estimated at about seven to eight millions of pesos, the principal commercial centers being Toluca, Tenancingo, Cuantitlán, Chalco, and Amecameca, most of the products going to México City.

The principal railway lines traversing the State are the Mexican National, the International, and the Interoceanic. The line from México to Salto has an extent of 44 kilometers, the México and Veracruz 60 kilometers, and the Central 66 kilometers. The Interoceanic has two tracks, one from México to Veracruz, and one from Morelos to Acapulco, the first 69 kilometers in length and the latter 86 kilometers. The several street railways measure 39 kilometers in length. Telegraph, telephone, and mail communications are efficient, there being over 300,000 meters of telegraph wires, 800,000 of telephone, and 23 post offices. The State is crossed in all directions by wagon roads.

The leading industries are the manufacture of cotton and woolen goods, bricks, cheese and butter, wines, glassware, wheat, flour, sugar, alcohol, pottery, and pulque.

Politically, the divisions are into 15 districts, subdivided into municipalities. The districts are:

Jilotepec de Abasolo, population 64,024, its chief town, Jilotepec, 39 kilometers from Toluca, the capital of the State.

Cuautitlán, population 32,162, with a chief town, bearing the same name, 109 kilometers from Toluca.

Zumpango de Victoria, population 29,758; its chief town, Zumpango de la Laguna, is 122 kilometers from Toluca.

Otumba de Morelos, population 34,613, the chief town of which, Otumba de Gómez Farias, is 114 kilometers from Toluca.

Texcoco de Mora, population 57,070; the chief town of which, Texcoco, near a lake of the same name, is a fine town containing several manufacturing establishments and the repair shops of the Interoceanic Railroad.

Chaleco de Díaz Covarrabia, population 66,422; its chief town, Chaleco, is quite a commercial center, a line of tramways running between it and Tlalmanaco, 21 kilometers in length.

Ixtlahuaca de Rayón, population 74,934; its chief town bears the same name, and is situated 78 kilometers from Toluca.

Valle de Bravo, population 43,742, the chief town of which bears the same name, and is situated 55 kilometers from Toluca.

Toluca de Lerdo, population 114,490; its chief town, Toluca, population 23,150, is also the State capital, and is a very beautiful city, containing many fine public buildings, breweries, ice factories, cotton mills, oil and flour mills. It is the principal commercial town in the State, and is situated 73 kilometers from México City (by rail two hours and fifty minutes), 497 kilometers from Veracruz, and is connected by rail with the principal cities of the Republic and of the United States.

Tenango de Arista, population 65,441; its chief town, of the same name, 25 kilometers from the capital of the State, has cotton, oil, and flour mills.

Lerma, population 45,483; its chief town, Lerma, is 13 kilometers distant from Toluca.

Tlalnepantla de Comonfort, population 57,401; its chief town, Tlalnepantla, is 12 kilometers from México City, with which it is connected by rail, and 77 kilometers from Toluca.

Tenancingo de Degollado, population 63,792; its chief town, Tenancingo, is an important commercial town 46 kilometers from Toluca.

Temascaltepec, population 39,472; its chief town, bearing the same name, is 25 kilometers from the capital of the State.

Sultepec de Alquisirás, population 52,814; its chief town, Sultepec, is 67 kilometers from Toluca.

The State of Michoacán de Ocampo, population 894,753; its capital,

Morelia, population 33,890, is one of the richest and most beautiful regions of the Republic. Its boundaries are Guanajuato on the north, México and Querétaro on the northeast, Guerrero and Colima on the southeast, Jalisco on the west, and the Pacific Ocean on the south. The State measures 55,693 square kilometers.

The general character of the State is mountainous, and it is immensely rich in vegetation. The coast line, which is generally low, measures 163 kilometers in extent. The Sierra Madre Mountains traverse the State, sloping down, in the southern part, to the basin of the Balsas River, and continuing their course on the farther bank of the river as the Sierra Coalcomán. Other ranges are Ozumatlán, Tajimaroa, Zitácuaro, Angangisco, and Tlalpujahua. The highest peaks are Tamtitado, 386 meters; Patambán, 3,750; Chincéó, 3,324; Tarimangacho; 3,104; Zirate, 3,340; San Andrés, 3,282; the volcano of Jorullo, 1,299, and several others of lesser importance.

The principal rivers are the Lerma, which irrigates the upper region of the State, running east and west, and, after receiving the waters of several affluents, finally empties into Lake Chapala; the Duero, flowing from southwest to northwest, and the Balsas, called also Zacatula and Atoyac, which flows from east to west, and has several tributaries. The Lake of Chapala, 1,580 square kilometers in extent, is on the Jalisco boundary, one-sixth of it belonging to the State of Michoacán. In the same region are the lagoons of Tacáscuaro and Magdalena. The Lake of Pátzcuaro, 36,090 meters long and 31,508 in breadth, contains five small islands, three of which are inhabited. Other bodies of water lying within the State limits are Lake Cuitzéó, the lagoon of Zirahuén, and of Zipimeo.

All varieties of climate are found in the State, the cold in the high altitudes being most intense, while the northern portion is temperate and healthy, the heat increasing toward the south, where fevers are prevalent.

The fauna of the State is rich and varied, the different species equaling in number those of other portions of the Republic. The same is true in regard to the flora. The principal agricultural products are cereals, canary seed, sesame and linseed, coffee, vanilla, rubber, tobacco, sugar cane, fruits of all kinds, and cabinet woods. Production, according to official data, was as follows in 1897: Number of plantations, 381, of which 1 was devoted to the cultivation of cotton, 1 to indigo, 12 to coffee, 82 to sugar cane, 202 to cereals; and 72 cattle ranches; the total yield of cereals being estimated at \$6,966,111; sugar-cane products, 18,704,151 kilograms, valued at \$1,941,031; coffee, 363,401 kilograms at \$210,457. The annual valuation of agricultural products varies from 14,000,000 to 15,000,000 pesos. The stock value of the State is calculated at about \$9,500,000, in the following order: Beef cattle, sheep, horses, hogs, goats, mules, and asses.

Michoacán is one of the richest mining sections of México, gold,

silver, copper, iron, cinnabar, lead, sulphur, copperas, marble, granite, and coal being among the minerals found in abundance. The number of registered claims on December 31, 1897, amounted to 221, covering an area of 2,196 hectares.

Commerce is one of the leading industries, the principal articles of trade being cereals, exported to the neighboring States of Guanajuato, San Luis Potosí, Querétaro, and to México City; coffee to Germany and the United States, and México City; fruits to the United States and to Querétaro and Guanajuato. Foreign trade is carried on through the ports of Veracruz and Manzanillo, and the frontier customs ports of Paso del Norte and Nuevo Laredo. The total trade of the State may be estimated at about \$25,000,000. The gold and silver mined is sent to the mint at México for coinage.

The line of the Mexican National Railroad, from Pátzcuaro to the City of México, traverses the State for an extent of 439 kilometers. It is also crossed by the Mexican Central, and concessions have been granted for two other roads. Three street-car lines are in operation, while there are good telegraph, telephone, and mail facilities, and some very good wagon roads. A steel steamboat navigates Pátzcuaro Lake.

The manufacturing industries are confined mainly to the production of cotton and silk shawls, cotton and woolen goods, palm hats, lace and embroideries, sugar-cane products, pulque mescal, cheese, wax matches, and beer. Sericulture and the culture of olive trees and grapevines are being introduced.

The State is divided into 15 districts, subdivided into 75 municipalities, the districts being as follows:

Piedad, population 61,876; its chief town, Piedad Cabados, is an important one, situated near the station of the Central Railway, 181 kilometers from Morelia, the capital of the State.

Puruándiro, population 90,455; its chief town, Puruándiro de Calderón, is the third city in the State from an industrial and commercial standpoint, is 86 kilometers from Morelia.

Morelia, population 128,894; its chief town, bearing the same name, is also the capital of the State, with 33,890 inhabitants. It has a number of fine public buildings, an aqueduct, several factories, a public library, and a museum. It is situated on a picturesque hill, about 377 kilometers from México City, and has tramway lines connecting it with the station of the Central Railway.

Zinapécuaro, population 49,367; its chief town, Zinapécuaro de Figueroa, is 54 kilometers from Morelia and 7 from Huingo station, on the Mexican National Railroad.

Maravatío, population 51,090; its chief town, bearing the same name, is 154 kilometers from Morelia.

Zitácuaro, population 65,928; its chief town, Zitácuaro de la Independencia, is 155 kilometers from Morelia on the line of the Michoacán road.

Huétamo, population 45,848; its chief town, Huétamo de Nuñez, is 252 kilometers from Morelia.

Tacámbaro, population 40,188; its chief town, Tacámbaro de Codallos, is 93 kilometers from Morelia.

Ario de Rosales, population 39,992; its chief town, bearing the same name, is 88 kilometers from Morelia.

Apatzingán, population 26,627; its chief town, Apatzingán de la Constitución, is 241 kilometers from Morelia.

Coalcomán, population 15,008; its chief town, bearing the same name, is 423 kilometers from Morelia.

Uruapán, population 81,228; its chief town, Uruapán del Progreso, is 125 kilometers from Morelia. The coffee from this district is valued very highly both in the Republic and abroad. The production is, however, very small.

Jiquilapán, population 57,176; its chief town, bearing the same name, is 245 kilometers from Morelia.

Zamora, population 88,366; its chief town, bearing the same name, is 128 kilometers from Morelia.

Pázcuaro, population 52,710; its chief town of the same name lies near the beautiful lake of Pázcuaro, 62 kilometers from Morelia.

The State of Morelos, population 159,355, capital Cuernavaca, with a population of 8,747, is a small but rich and progressive State, whose boundaries are the Federal District to the north; the State of México on the west, northwest and northeast; Puebla on the east and southeast, and Guerrero on the south and southeast. Its area is 4,758 square kilometers.

The topographical conditions are varied, embracing high mountain ranges, snow-capped volcanoes, beautiful valleys, and deep ravines. The northern part is the mountainous section. There rises the lofty Sierra de Ajusco, while the Huitzilac, Tepoctlán, and Santo Domingo ranges extend from west to east until they meet the Tlayacapan mountains. The highest peaks in these ranges are Yepac, Ololuica, and Ocotecatl. In the northeast are the Popocatepetl and the Ixtacihuatl ranges, while other mountain chains cross the State in all directions.

The State may be said to belong to the basin of the Amacuzac River, which traverses it from west to east. This river is formed by the junction of the San Jerónimo and Chontaleuallán and receives a large number of tributary streams, among them the Chalma, Alpuyeca, Tepalcapa, Yautepec, Jojutla, Tlaquiltenango, and Cuantla rivers. The principal lake is Lake Tequesquite, which occupies the site of the old town bearing the same name, and which, by reason of a subsidence of the ground, due to frequent inundations, was engulfed about half a century ago by the waters used in irrigating the land. The church spire may yet be seen in the middle of the lake. Others are the Miacatlán and Hueyapán lakes. Mineral hot springs abound.

The climate is hot and unhealthy in the southern and central regions, extremely cold in the northern or mountainous portions, and temperate on the mountain slopes. Rainfall is moderate throughout the territory with the exception of the slopes of the northern mountains, where it is very abundant. Frosts are of infrequent occurrence. The prevailing diseases are malarial and typhus fevers and affections of the respiratory and digestive organs.

Both fauna and flora are rich and varied, embracing the same species indigenous to other States of the Republic.

From an agricultural standpoint, Morelos is one of the richest States in México. The principal products are sugar cane, rice, corn, coffee, wheat, and garden vegetables. The first cane plantation and sugar mill in México was established by Cortés in Tlaltenango, and since that time its culture has advanced steadily and continuously, it being now the leading article of production of the State of Morelos. Rice yields at the rate of 200 kilograms for 1 kilogram of seed; corn, 100 to 200 hectoliters for 1 hectoliter sown, and other products render adequate returns for their culture. In 1897, according to official figures, the State's production was estimated as follows: Rice, 3,730,076 kilograms, at \$381,592; corn, 272,485 hectoliters, at \$609,197; wheat, 50,000 kilograms, at more than \$3,000; sugar-cane products (direct), 64,052,453 kilograms, valued at \$5,821,443; rum, 62,366 hectoliters; at \$1,430,475; mescal to the value of \$122,222. The annual value of fruit products may be estimated at \$1,250,000, and of leguminous plants, \$70,000. The extent of coffee culture is indicated by the fact that a few years ago 1,000,000 trees were planted. Stock raising does not receive much attention, the total value of all kinds, including beef cattle, sheep, and goats, being \$1,250,000. Mining occupies an inferior position among the industries of the State, although within its territory are found silver, galena, marble, alabaster, cinnabar, iron, gold, lead, petroleum, and coal.

Morelos is an important mercantile center, not only on account of its proximity to the Federal District, but also by reason of its immense sugar-cane interests. The Interoceanic Railroad does not suffice for the traffic in these products, the supplementary use of mule paths being also found requisite for their conveyance to México City. About \$3,000,000 is the calculated annual export value of cane products such as sugar, rum, and molasses. Fruit exports figure at about \$1,000,000, and other products, including corn, coffee, mescal, etc., about \$100,000. Imports may be estimated at about \$2,000,000, and include alimentary products, furniture, clothing, books, implements, arms and ammunition, and hardware.

The Interoceanic Railway traverses the State from northeast to southwest, having seven stations in its extent of 76 kilometers. A concession has recently been granted for a line between Toluca and Cuernavaca, and there is a prospect for the Valley Railway being

extended to the latter city. Good wagon roads exist and telegraph, telephone, and mail service is efficient.

The manufacturing industries, in addition to the development of cane products, include the preparation of mescal, and the manufacture of beer, flour, chocolate, oils, cigars, bricks, tiles, hair bridles and halters, ixtle bags, and cotton goods. Pottery works and tanneries also make good returns.

The State of Morelos is divided into 6 districts, subdivided into 26 municipalities, as follows:

Cuernavaca, population 40,014; its chief town, bearing the same name, is also the capital of the State, on the river Tepeyte, 76 kilometers from the City of México. It is an important commercial center, possessing very fine public buildings, among others the Palace of Cortés, where the State Legislature meets, a Meteorological Observatory, and the public library. The population of the capital numbers about 8,747 inhabitants.

Yautepec, population 20,277; its chief town, Yautepec de Zaragoza, is 25 kilometers from Cuernavaca and 161 kilometers from the City of México, with which it is connected by the Interoceanic Railway.

Morelos, population 27,916; its chief town, Cuantla Morelos, is 44 kilometers from Cuernavaca, and is connected with the capital of the Republic by rail.

Jonacatepec, population 26,431; its chief town, Jonacatepec de Leandro Valle, is 74 kilometers from Cuernavaca.

Juarez, population 20,476; its chief town, Jojutla de Juarez, is 50 kilometers from Cuernavaca, and is connected with the City of México by rail.

Tetecala, population 24,241; its chief town, Tetecala de la Reforma, is 48 kilometers from Cuernavaca.

The State of Nuevo Leon, population 309,252; its capital city is Monterey, population 45,695, occupying a very fertile and well-watered region, abounding in minerals. The boundaries are Coahuila on the north, northwest, and west; San Luis Potosí on the south and southwest, and Tamaulipas on the northeast, east, and southeast. Its area is 107,233 square kilometers.

Nuevo Leon occupies the eastern slope of the central plateau, extending in a northeasterly direction. The Sierra Madre Mountains traverse the State at a mean elevation of 1,676 meters above sea level for a distance of 252 kilometers. Among its numerous peaks, the Potosí is the principal, its summit being covered with snow during part of the summer. These mountains come to an abrupt end in the northern part of the State; here another chain starts whose highest peaks are known as the Silla, Mitra, Topo, and Salinas. At the latter point the chain is bifurcated forming two new ranges, viz, the Sierra de Gomas on the north and the Sierra de Picachos on the south.

Twelve rivers and 100 smaller streams irrigate the State besides

numberless brooks. None of these water courses, however, are navigable. The principal river is the Salado, its waters abounding in fishes and fine pearl oysters. It receives the waters of many tributaries and flows from west to east emptying in the Rio Bravo. The Santa Catarina, the Ramos, the Pílon, the Rio Grande de San Juan, the Potosí, the Hualahuises, and Pablillo rivers follow in the order mentioned. There are also two lagoons and several hot springs, but no lakes.

The climate varies according to the altitude, but it is generally temperate and healthy, the extreme of heat being found in the north and east where the land is low, while on the high lands of the south a moderate temperature prevails, varying in the Sierra Madre Mountains according to the altitude. The rainfall is variable, and winds come in general from the east and northeast.

The fauna and flora of the State possess the same qualities and extent as other Mexican States.

Agriculture has been steadily progressing, rising in value from \$717,450 in 1872 to \$5,000,000 in 1899. The latest Mexican statistical annual (1897) credits the State with 328 plantations, 226 of which are devoted to the cultivation of sugar cane and 82 to cereals, and 20 cattle ranches. Production is estimated as follows: Barley, \$34,492; corn, \$1,521,416; wheat, \$143,542; sugar-cane products, 15,287,263 kilograms, valued at \$1,194,031; mescal, 6,452 hectoliters, for \$146,291; ixtle, 1,150,442 kilograms at \$70,295. The value of stock in the State is estimated at \$6,000,000, the different varieties classed as follows: Goats, sheep, beef cattle, horses, hogs, asses, and mules.

The mineral wealth of the land has been very slightly developed, although there exist mines of iron, copper, silver, lead, coal, sulphur, marble, etc. On the 31st of December, 1897, the number of registered claims was 150, covering an area of 1,278 hectares.

Among the exports may be mentioned shipments of cattle to Texas (United States) and to some Mexican States, also agricultural products and a small quantity of cotton and woolen goods. The mercantile movement may be estimated at about \$15,000,000 per annum. Imports include clothing, textile fabrics, hardware, drugs, paper, wines and liquors, coffee, tea, machinery, implements, arms, etc., estimated at a value of about \$8,000,000 per annum.

The Mexican National Railroad crosses the State from west to northeast, having 31 stations in its course of 280 kilometers. The Monterey and Gulf of México road crosses it from west to south on its way to the State of Tamaulipas. A branch of the Mexican National, from Matamoros to Monterey is in process of construction. There are 20 kilometers of tramways, all starting from Monterey, also fine wagon roads in all directions. Telegraph, telephone, and mail service is efficient.

In addition to the manufacturing industries connected with the sugar interests, there are three large cotton mills, also one for the

manufacture of cloth and cassimeres, and several chocolate, rope, beer, and match establishments.

Nuevo Leon is divided into 48 municipalities, grouped as follows: Municipalities of the north, 17; of the east, 14; of the south, 13; of the west, 3, and of the center, 1.

The principal cities of the municipalities are:

Northern group:¹ Lampazos de Naranjo, population 7,905, on the Mexican National Railway, 154 kilometers from Monterey; Villal-dama, population 5,629, on the same road, 94 kilometers from Monterey; Marín, population 3,092, and Sabinas Hidalgo, population 7,005.

Eastern group: Cadereyta Jimenez, population 17,023, on the Monterey and Gulf Line, 42 kilometers from the capital of the State, and Cerralvo, population 6,678, 125 kilometers from Monterey.

Southern group: Santiago, 11,007 population, 42 kilometers from Monterey; Montemorelos, population 16,636, on the Monterey and Gulf Line, 96 kilometers from the capital; Linares, population 20,204, the second city in the State, 180 kilometers from Monterey, and Doctor Arroyo, 21,169 population, 302 kilometers from Monterey.

Western group: García, population 4,575, which is the only large town in this section, situated on the Mexican National Line, 37 kilometers from Monterey. This portion of the State contains two large cotton mills, one at Garza García, with 17,740 spindles and 72 looms, producing from 15,000 to 20,000 pieces per annum, and another at Santa Catarina, population 4,625, whose output is estimated at 16,000 pieces.

Central municipality, or the municipality of Monterey, population 56,326, contains the capital of the State, Monterey, with 45,695 inhabitants, situated 975 kilometers from the City of México by wagon road and 1,079 by the Mexican National Line. Monterey is a handsome city, possessing very fine public buildings and all the conveniences of civilization. It is the first commercial city of the northern Mexican frontier and is connected by rail with the principal cities of México and the United States. Among its industrial establishments are a blanket and cassimere factory, breweries, ice factories, foundries, saw-mills, flour mills, chocolate, match, wagon, and carriage factories. There are three tramways, measuring 13 kilometers in length, that cross the city.

The State of Oaxaca de Juarez, population 884,909, capital city Oaxaca, population 32,437, is one of the most important sections of the Republic. Its boundaries are the States of Puebla and Veracruz on the north, Veracruz and a portion of Chiapas on the north-east and east, Chiapas and the Pacific Ocean on the south, and the State of Guerrero on the west and northwest. Its area is 91,664 square kilometers.

¹ Only towns of 3,000 inhabitants or over are mentioned.

It occupies a beautiful and fertile region, irrigated by a number of rivers and lesser streams which traverse the numerous valleys. The Sierra Madre Mountains cross the whole State, their ramifications extending throughout the territory, and forming such valleys as the Nochitlán or Mixteco, 2,111 meters above sea level. The maritime range, called Sierra del Sur, is composed of high mountains whose slopes are covered by virgin forests. The Zempoaltepec, 3,397 meters in height, is the starting point of the several ramifications of the Sierra Madre. The beautiful valley of Oaxaca or Antequera occupies the greater part of the central region, the San Felipe del Agua peak, 3,125 meters above sea level, representing its highest altitude. Other mountain tops vary in height from 1,300 to 2,275 meters. The Isthmus of Tehuantepec is traversed by the Tarifa and Chimalpa mountains.

Oaxaca, being one of the maritime States of México bordering on the Pacific Ocean, has a coast line of 530 kilometers. These shores are low and sandy. The natural ports are Chacahua, Puerto Escondido, Puerto Angel, San Agustín Huatules, San Diego, La Ventosa, and Salina Cruz, the latter being the starting point of the international railroad that is to connect the Pacific Ocean and the Gulf of México. Salina Cruz is an open port with a deep harbor where the largest vessels may safely anchor. Puerto Angel is a sheltered port, quite deep, but too narrow to permit the passage of large vessels. These are the only ports open to foreign and coastwise traffic. There are numberless bays, bars, roads, and a few islands. The Gulf of Tehuantepec is one of the most important in the Republic, being about 210 kilometers in length from east-southeast to west-northwest, and 55 kilometers from north to south, and affording numerous ports, road, harbors, and places of anchorage.

Most of the streams irrigating the State can not be properly called rivers on account of their short courses. The principal ones, all draining into the Pacific, are: The Atoyac, 293 kilometers in length, receiving the waters of numerous tributaries; the Tehuantepec, which, with its numerous tributaries, traverses an extent of 294 kilometers, and the Arena, or Pinotepa, the Tonameca, and Copalita. The principal lakes are the Superior and the Inferior, both in the Isthmus of Tehuantepec, Alotengo, and Chacahua, all communicating with the Pacific Ocean.

The climate is generally hot and unhealthy on the seacoast and lowlands adjacent to the State of Veraacruz; temperate in the Valley of Oaxaca and on the mountain slopes, and cold in the higher altitudes and throughout almost the whole region of the Mixteca Alta. Rainfall is moderate in the State and frosts are of infrequent occurrence. Fevers and affections of the digestive organs are most prevalent, yellow fever occurring principally on the coast.

The fauna and flora of the State present the same general features as in the other parts of the Republic.

The principal agricultural products are cereals, sugar cane, cotton, coffee, and tobacco. Official figures estimate the number of plantations at 199, classified as follows: Coffee, 41; sugar cane, 75; cereals, 60; maguey mescal, 9; tobacco, 7; and 7 cattle ranges. The production of cereals, corn, and wheat was estimated, in 1897, as having a value of \$4,949,563; sugar-cane products (direct), 12,714,428 kilograms, valued at \$999,403; rum, 21,147 hectoliters, at \$268,359; mescal, \$172,623; other maguey liquors, \$103,708; coffee, 2,770,305 kilograms, at \$1,249,176, and tobacco, 3,193,518 kilograms, at \$1,828,642. The yearly agricultural production of the State may be estimated at about \$15,000,000.

Stock raising represents a value of about \$4,000,000, the leading species being sheep, goats, beef cattle, hogs, and horses.

From a mining standpoint Oaxaca is immensely rich, but so far its wealth has not been properly exploited. The principal minerals found are silver, gold, iron, lead, coal, marble, and salt.

The State maintains an active trade with the States of Veracruz, Puebla, and Chiapas, and sends its coffee, hides, cochineal, flour, sugar, minerals, indigo, oils, tobacco, and other products both abroad and to other parts of the Republic. The list of foreign imports embraces about 200 articles, the principal being machinery, agricultural implements, hardware, canned goods, beer, wines and liquors, cotton, woolen and silk goods, etc.

The ports of Salina Cruz and Puerto Angel are maritime customs ports, their trade is estimated at about \$700,000 per annum, their exports being almost double the imports. The entire trade of the State is calculated at from 16,000,000 to 18,000,000 pesos.

The Southern Mexican Railroad runs from Puebla to Oaxaca on its way to the Guatemalan frontier, with a branch line to Puerto Angel. The Interoceanic runs from Salina Cruz on the Pacific to Coatzacoalcas, on the Gulf of México, a distance of 304 kilometers. The city of Oaxaca contains good tramways. The State is also in communication with the adjacent States by means of high roads, telegraph, and mail routes, there being also an efficient telephone service. Maritime communication by the ports of Salina Cruz and Puerto Angel is carried on by the Pacific Mail Steamship Company, the Hamburg-American Line, and the Mexican Line "Pacific and Gulf of California." There is also a line of steamers, owned by a Mexican company, navigating the river Papaloápam, and plying between Tlacotalpam (Veracruz) and Tuxtepec.

The industries of the State are agriculture and the extraction of the maguey fiber, called *pita de Oaxaca*, as well as the manufacture of

woolen and cotton fabrics, furniture, pottery, candles, soap, matches, chocolate, and tobacco.

The State is divided into 26 districts, subdivided into 463 municipalities, which according to their geographical position are grouped as follows:

Northern: Silacayoápam, population, 27,360; Huajuápam, 44,811; Teposecolula, 31,081; Coixtlahuaca, 16,924; Teotitlán, 35,576; Cuicatlán, 22,142, and Tuxtepec, 30,717, their principal towns being Silacayoápam, 277 kilometers from Oaxaca; Huajápan de Leon, 202 kilometers from Oaxaca; Coixtlahuaca, or Villa de Libres, 120 kilometers from the capital of the State, and Tuxtepec, 260 kilometers from Oaxaca.

Eastern: Villa Alta, population 40,150; Choapám, 11,763; Tehuantepec, 31,757, and Yautepec, 24,134; the principal towns being Villa Alta, Choapán Santiago, Yautepec, and Tehuantepec, population 9,415, the latter being the second city in the state, on the line of the Isthmian Inter-oceanic road, 294 kilometers from Oaxaca and 21 from the port of Salina Cruz, and is a fine, progressive town.

Southern: Juchitán, population 44,966; Miahuatlán, 40,963; Pochutla, 20,807; Juquila, 21,662, and Jamiltepec, 44,994, their principal cities being Juchitán, or Ciudad de Zaragoza, near the Inter-oceanic road; Miahuatlán, Pochutla, near Puerto Angel; Juquila, and Jamiltepec.

Western: Tlaxiaco, population 64,617, and Juxtlahuaca, 20,265, with their principal towns Heroica Tlaxiaco, an important industrial town, and Juxtlahuaca or Villa Albino Zertuche.

Central: Centro, population 66,381; Nochixtlán, 41,300; Villa Alvarez, 45,699; Ejutla, 24,121; Tlacolula, 41,417, and Ocotlán, 33,575, the chief town of which is Oaxaca de Juarez, situated in the Centro district and capital of the State, with 32,437 inhabitants. It is 464 kilometers from México City, 340 from Puebla, and 464 from Veracruz. This is one of the handsomest and most advanced cities in the Republic, containing fine public buildings, tramways, and equipped with all modern conveniences. It is also the leading industrial and commercial center of the State. Other towns are Etla de Santiago, Nochixtlán Asunción, Villa Alvarez or Zimatlán, Heroica Ejutla Crespo, Tlacolula de Matamoros, and Villa de Morelos or Ocotlán de Santo Domingo.

The State of Puebla, population 984,413, with its capital city bearing the same name, is bounded on the north and east by Veracruz, on the south by Oaxaca and Guerrero, and on the west by Morelos, México, and Hidalgo, its area being 34,380 square kilometers. The general topographical aspect is mountainous, the principal peaks being Popocatepetl and Ixtatzihuatl, the volcanoes of San Andrés and Perote, and the mountain ranges Huanchinango, Zacatlán, Zacapoaxtle, Tezuitlán, and Mixtecas. The most important plains are San Juan de los Llanos, Chalchicomula, Tecamachalco, Tepeaca, Tepeji, and the principal

valleys those of Texuelucán, Atlixco and Puebla. Among the rivers may be named the Atoyac and its tributaries, the Vinasco, Pantepec, Cazones, Zempoala, and Mecaxa, the latter forming, in the district of Huauchinango, a beautiful cascade 162 meters high. There are four lakes, called Quecholac, Tlachiehica, Epatlán, and Tepehuayo.

The climate shows varying degrees of temperature, being temperate on the plains, hot in the south, and cold in the northern districts.

The fauna and flora present the same general characteristics peculiar to other States of the Republic.

Agriculture is the leading industry, the chief products being cereals, sugar cane, coffee, vanilla, and delicious fruits of all kinds. Official figures credit the State with 483 plantations, divided as follows: Three hundred and twenty-eight devoted to cereals, 67 to sugar cane, 26 to maguey pulque, 14 to coffee, 6 to tobacco, and 42 to cattle raising. The production for 1897 is given as \$8,746,999 for cereals; sugar-cane products (direct), 6,801,718 kilograms, valued at \$786,307; rum, \$5,185,675; maguey products, \$543,298; coffee, \$503,338, and tobacco, \$47,959.

The principal minerals found are gold, silver, and copper, marble also existing in large quantities.

The commerce of the State is characterized by the same features as that of other States of the Republic, the exports consisting principally of agricultural products, and the imports of manufactured articles of common utility.

In addition to several wagon roads, the means of intercommunication in the State consist of a branch line of the Mexican Railroad from Puebla to Apizaco; the Interoceanic, connecting the State capital with the city of México, and the Matamoros line.

Telegraph, telephone, and mail services are efficient.

The manufacturing industries are similar in the main to those of the other Mexican States.

The State is divided into 21 districts, subdivided into municipalities. Geographically the districts may be grouped as follows:

Northern group: Embracing Alatriste, population 30,294; Huauchinango, 66,938; Tetela, 33,942; Tezuatlán, 26,398; Tlatlauquitepec, 21,392; Zacapoaxtla, 31,210, and Zacatlán, 63,665, their principal cities are Chiguanapám, Huanchinango, Xicotepec, Tetela, Tequitlán, Tlatlanqui, Zacapaxtle, and Zacatlán.

Central group: Atlixco, population 49,275; Cholula, 48,093; Huejotzingo, 42,422; San Juan de los Llanos, 32,102; Chalhicomula, 67,429; Puebla, 100,993; Tecali, 29,970, and Tepeaca, 43,159, the principal towns are Atlixco, which is an important town on the Matamoros and Puebla Railroad, containing some fine public buildings, cotton mills, and other industrial establishments; San Pedro Cholula, Huejotzingo, on the Interoceanic line; San Pedro de los Llanos, on the

same line; San Andrés Chalchicomula, on the Mexican Railway; Tecali, Tepecaca, and Puebla, the capital, containing 88,684 inhabitants. This latter is one of the oldest and most important cities of the State, possessing many handsome buildings, among others the Cathedral and several churches, the State college, containing over 24,000 volumes; the Palace of Justice, the School of Medicine, and the "Palafoxiana" Library, with more than 100,000 volumes; the Palace of Congress, the Episcopal Palace, several hospitals, the Academy of Fine Arts, and three theaters. The city is one of the most important in the Republic by reason of its commerce and industries, possessing several cotton and woolen mills, glass factories, and other establishments.

Southern group: Acatlán, population 45,626; Chiautla, 39,680; Matamoros, 39,906; Tehuacán, 71,351; Tepexi, 49,848, and Tecama-chalco, 50,924, the principal towns of which bear the same names.

The State of Querétaro-Arteaga, population 228,551, whose capital city is Querétaro, population 34,576, is one of the smallest in the Mexican Republic, rich in minerals, well irrigated, and prosperous. Its boundaries are San Luis Potosí on the north, Hidalgo on the east and northeast, México to the southeast, Michoacán on the south, and Guanajuato on the west. The area is estimated at 14,927 square kilometers.

Topographically the State may be divided into two regions, the northern portion being mountainous, the ranges extending toward the center, while the central and southern sections are occupied by plains and valleys. In the north are the Sierra Gorda Mountains, running from west to east, these mountains being also known as the Sierra de Querétaro. Among the peaks are the Cerro Alto, Cerro Colgado, Cerro del Campanario, Pilón, Santa Rosa, Cimatario, Minteji, and the historic Cerro de las Campanas, where Maximilian, Miramón, and Mexía were shot.

Querétaro is irrigated by a large number of rivers and smaller streams, the principal being the Concé or Jalpán, emptying into the Ayutla; the Extoraz, the Moctezuma, the Galinda, Querétaro, Juriquilla, and their tributaries. There are several small lakes, the principal being Cerro Grande, Concé, Sancillo, and Saledón; also many swamps and mineral springs.

Climatic conditions vary with the altitudes. Rainfall and frosts are moderate, and the winds are variable. The prevailing diseases are malarial and other fevers; also affections of the respiratory and digestive organs.

The fauna and flora possess the same general characteristics as do those of the other Mexican States, being varied and abundant.

The State of Querétaro occupies a very fertile region, producing all kinds of cereals, leguminous plants, fruits, etc., so that agriculture is the principal industry. Cotton, sugar cane, and wheat are also culti-

vated, the latter yielding 100 grains to the seed, and being considered the best in the Republic. In 1897 the number of plantations in the State were, according to official figures, 195, of which 179 were devoted to the culture of cereals, 9 to maguey mescal, 2 to sugar cane, and 5 to cattle breeding, the yearly product being estimated in the following values: Cereals, \$2,466,981; maguey products, 51,074 hectoliters, at \$150,845; ixtle, 39,330 kilograms, at \$3,436, and tobacco, \$1,380. Stock may be estimated at a value of about \$2,500,000.

Minerals abound throughout the entire State, Cadereyta and Tolinán being the richest mining regions. The principal products are silver, galena, copper, iron, cinnabar, mercury, coal, and lead, while among the precious stones are opals, garnets, and similar deposits. There are 59 mines in the Cadereyta district, 8 in Tolinán, and 35 in Jalpán. There are over 20 establishments for the reduction of ores, all of which, however, are not in operation.

The trade of the State may be estimated at from 9,000,000 to 10,000,000 pesos per annum. This is carried on principally with the neighboring States, corn, wheat, and other cereals, fruits, jerked beef, etc., being sent thither, and mineral products shipped to the United States. The imports follow the same general line as the imports of the other Mexican States, most of them coming from the United States, Europe, and México City, and are estimated at a value of about \$5,000,000, exports being calculated at \$4,000,000.

The Mexican Central Railroad traverses the State from southeast to west for an extent of 95 kilometers, and has several stations. The various districts also are crossed by tramways, and good wagon roads are abundant, the mail, telegraph, and telephone services being especially efficient.

In addition to agriculture and mining, such industries as linen, woolen, and cotton-goods manufactories, flour mills, distilleries, breweries, paper mills, etc., flourish.

The State is divided into 6 districts, subdivided into municipalities. The districts are:

Jalpán, population 33,786, which is a rich mining section, and whose principal town is Jalpán, situated 127 kilometers from the capital of the State, Querétaro.

Cadereyta, population 24,312, the richest mining district of the entire State; the chief town, Cadereyta Mendez, is 76 kilometers from Querétaro.

San Juan del Río, population 41,077; its chief town, bearing the same name and having a population of 9,040, is situated 59 kilometers from Querétaro, on the Central Railroad, and is the second city of the State. A line of street cars traverses the town.

Tolinán, population 27,320; its chief town Tolinán, or San Pedro de Tolinán, 117 kilometers from Querétaro, is noted for its opals.

Querétaro, or Distrito del Centro, population 80,697, the chief town of which is Querétaro, also the capital of the State, situated 246 kilometers from the City of México, and containing 34,576 inhabitants. Besides its great commercial importance, this city is perhaps the most interesting, historically, in México, having been the cradle of Mexican independence, the residence of the Executive during the war with the United States, and the place where the peace treaty was signed in 1848; also the last refuge of Maximilian and the place of his execution.

The principal buildings are the Federal Palace, the Government Palace (both built of basalt), the Municipal Palace, the custom-house, the cathedral and other churches, several hospitals, the historic "Iturbide" Theater, and the bull ring. An excellent aqueduct, 8 kilometers in length, furnishes the supply of water, and several cotton and woolen mills and other industrial enterprises are in a flourishing condition. The town next in importance in the district is Hercules, notable on account of the Hercules Mills, the largest textile factory in the Republic.

Amealeco, population 21,359, with a chief town of the same name situated 67 kilometers from Querétaro.

The State of Sinaloa, population 258,865, whose capital city is Culiacán, population 10,487, is one of the rich mining and agricultural sections of the Mexican Republic. It is bounded on the north by Sonora and Chihuahua, on the east by Chihuahua and Durango, on the south by the Territory of Tepic and the Pacific Ocean, and on the west by the Gulf of California. Its area is about 69,346 square kilometers, and its population 258,845 inhabitants.

The Gulf of California extends along the coast of the State from Agiabampo Bay to the south of Mazatlán, at which point the Pacific coast line begins. Numerous bays and harbors are formed by the waters of the gulf, the principal being the bay of Topolobampo, on which is situated the port of the same name, generally considered to be the best on the Pacific coast by reason of its sheltered location. There are also the bays of Olas Altas, Mazatlán, Agiabampo, San Ignacio, Navachiste and others indenting the litoral of the State, and forming small interior bays, in whose waters appear the islands of Mero, San Felipe and Pájaros. Other islands along the coast are Saliaca, Altamura, Lobos, San Ignacio, Guinorama, Macapule, Chundo, and Cuestión.

The general topographical condition of the State is mountainous, the land rising gradually from the gulf coast to the Sierra Madre mountains, which traverse Sinaloa north and south and constitute the principal range of the section. Others are the Sanabari Mountains, the Gacopira, Aguablanca, Cosalá, Guadalupe de los Reyes, Tasajera, Navachiste, Cuitaboa, and Tescalama. These systems embrace several peaks and plateaus.

Sinaloa is one of the best irrigated sections of the Republic, many

of its rivers, such as the Fuerte and Sinaloa, being navigable. Nearly all the streams rise in the Sierra Madre and empty into the Gulf of California, the principal being the Fuerte, 670 kilometers in length; the Sinaloa, 420 kilometers; the Moscorite, 108 kilometers; the Culiacán, 252 kilometers; the Quila, 156 kilometers; the Elota, 221 kilometers; the Piaxtle, 203 kilometers; the Presidio or Mazatlán, 167 kilometers; the Chametla or Rosario, 165 kilometers, and the Canoas or Telapán, 152 kilometers. These rivers all have numerous tributaries and there are in addition over 200 smaller streams traversing the State.

Climatically the State may be divided into two regions: The western, or hot belt, which is also the maritime section, devoted to agriculture, and the eastern or cold belt, which is the mountainous district, devoted to mining. Rains are abundant on the coast, and in the mountains the precipitation is excessive, frost also being of frequent occurrence. Winds are variable, the northeastern predominating.

The fauna and flora partake of the same characteristics as the majority of Mexican States.

The principal agricultural products are cereals, cotton, tobacco, sugar cane, coffee and fruits, their total valuation being about \$8,000,000 per annum. According to Mexican official figures, in 1897, there were 121 plantations in the State, divided as follows: Cotton, 9; sugar cane, 20; cereals, 20; maguey mescal, 24; and 48 cattle ranches, the estimated value of their products being: Cereals, \$6,154,105; sugar cane products (direct), 2,393,401 kilograms, at \$327,035; rum, \$18,988; mescal, \$212,350; tobacco, \$18,350; cotton, \$16,267; henequén and ixtle, \$6,000. Stock raising has an estimated value of about \$9,000,000 a year.

It is claimed that Sinaloa is the richest mining region of México, the standard of its production being higher than that of Guanajuato, Zacatecas, and Pachuca. The mining district lies in the east of the State, gold, silver, copper, iron, and lead being the principal metals. There are also rich salt deposits, mineral springs, etc. Culiacán Rosales contains fine reduction works and a mint.

An active import and export trade is carried on through the port of Mazatlán, manufactured articles of all kinds being received in return for minerals and other native products. Altata and Mazatlán are the two customs ports. Imports are valued at about \$6,000,000, and exports, \$5,000,000, while the total trade, including local traffic amounts to from 18,000,000 to 19,000,000 pesos per annum.

The Sinaloa and Durango Railway, also called the Western Mexican, has several stations between Altata and Culiacán de Rosales, and the International is constructing a branch line from Villa Lerdo (Durango) to Topolobampo in addition to the Tepic road which is to traverse the coast. There are tramways in the city of Mazatlán and many fine wagon roads connecting the principal towns with those of the adjacent

States. Coastwise trade is carried on by several steamship lines, while the Pacific Mail and the Mexican International line furnish communication with foreign countries.

The telegraphic, telephonic, and mail services are efficient and extensive.

The State is politically divided into 10 districts, subdivided into *directorías*, as follows:

El Fuerte, population 31,570, with a chief town of the same name, 230 kilometers from Culiacán, the State capital.

Sinaloa, population 41,147; its chief town of the same name is 160 kilometers from Culiacán.

Mocorito, population 20,819, the chief town of which, bearing the same name, is situated 22 kilometers from Culiacán.

Culiacán, population 37,803; its chief town, Culiacán Rosales, is also the capital of the State, containing 10,487 inhabitants and situated 1,478 kilometers from the capital of the Republic. This is an important commercial center, connected with the port of Altata by a railroad 62 kilometers in length, possessing very fine public buildings, among others the Government palace, the Mint, and the Cathedral. Cotton mills and other industrial establishments flourish. Next in importance is the city of Altata, a seaport having a large maritime movement. It is provided with a fine wharf, a powerful beacon light, and a custom-house.

Cosalá, population 18,217; its chief town, bearing the same name, is 151 kilometers from Culiacán.

San Ignacio, population 11,846, with a chief town of the same name situated 250 kilometers from Culiacán.

Mazatlán, population 36,807. The chief town, Mazatlán, population 15,852, is the first port of the Republic, situated 246 kilometers from Culiacán and 1,185 from the City of México. It is built on a small peninsula opposite the Bay of Olas Altas and contains a weather bureau, a fine custom-house, and other public buildings; a chamber of commerce and a system of tramways. It is the foremost commercial and industrial Mexican town on the Pacific Ocean, the residence of several foreign consuls, and the touching point for the steamship lines above referred to.

Rosario, population 28,122; the chief town, bearing the same name, is 322 kilometers from Culiacán.

Concordia, population 17,940; the chief town, bearing the same name, is 299 kilometers from Culiacán.

Badiraguato, population 17,594, its chief town, of the same name, situated 76 kilometers from Culiacán.

The State of Sonora, population 191,281, the capital city of which is Hermosillo, population 8,474, is one of the most northern of the Mexican States, and is on the United States border. In size it is the second

State in the Republic, having an area of 199,224 kilometers. Its boundaries are: On the north, Arizona and New Mexico (United States); on the east, Chihuahua; on the west, the Gulf of California, and on the south, Sinaloa.

The State is washed by the Gulf of California for a distance of 860 kilometers, from the mouth of the Colorado River to the port of Agiabampo. This gulf is 1,190 kilometers in length and 306 in breadth, at its widest point. The Sonora litoral, which is low and arid, extends in a line almost parallel to Lower California, a peculiarity of the region being that the rain falls from a cloudless and serene sky. Several islands lie along the coast, among them being San Pedro Nolasco, San Pedro Martín, Tiburón, Patos, San Jorge, and Pelicano; as well as many capes, bays, etc. Guaymas is the principal gulf port of the State.

In the east Sonora is traversed by the Sierra Madre Mountains, from which extend various ramifications forming beautiful valleys, ravines, and canyons. The principal of these secondary chains are the Sierras Guadalupe, San Luis, Batuco, Alamos, Antimez, Bacatete, and Prietas. The western portion is flat, and the largest valley is that of Guaymas.

The principal rivers, all of which empty into the Gulf of California, are the Altar, also called Asunción and San Ignacio, 358 kilometers in length; the Yaquí, 838 kilometers; the Mayo, 293 kilometers; the Sonora, 410 kilometers, and the Mátope, 234 kilometers. There are other streams of lesser importance, and a lake, called San Rafael.

The climate varies according to the altitude, is cold in the mountains, temperate on the slopes, and hot and dry near the coast and in the valleys. During the summer season the thermometer reaches 98° F. in Hermosillo, and in Guaymas it has gone as high as 119°. The minimum temperature for the winter months is 45°. Rainfall is moderate, and frost occurs occasionally in some districts, more especially in the Sierra Madre regions.

The fauna and flora are remarkable for their wealth and variety, embracing the same species common to the rest of the country. The Gulf of California is noted for its fish and for its pearl oysters, the latter, it is claimed, yielding gems superior to those of the Gulf of Aden, in Asia.

Notwithstanding the fertility of the soil, a lack of adequate irrigation facilities, in certain sections, is a drawback to agricultural development. The principal products are cereals, tobacco, cotton, sugar cane, fruits, etc. According to the official figures for 1897, the number of plantations in the State was 270, divided into: Sugar cane, 40; cereals, 179; fruits, 3; maguey mescal, 8; tobacco, 13, and 27 cattle ranches, producing cereals to the value of \$1,661,944; sugar-cane products, 1,022,935 kilograms, at \$123,777; mescal, \$1,097,320; cotton, 277,165 kilograms, at \$82,452; tobacco, 222,190 kilograms, at \$46,890.

At one time cattle were extensively exported to the United States, but owing to the high duties, almost prohibitory, imposed by that country this branch of commerce has decreased.

Sonora is classed not only among the richest mineral producing sections of México, but also of the world, the leading products being silver, lead, gold, copper, coal, antimony, iron, cinnabar, and graphite. Exports of these minerals to the United States are estimated at a value of from 10,000,000 to 12,000,000 pesos per annum. Although many of the mines are in exploitation, an equal number are lying idle.

Owing to its geographical position all the foreign trade of the State is with the adjacent States and Territories of the American Union, while its home trade is carried on with Sinaloa, Chihuahua, and Lower California. The principal exports are metals and metallic ores, fruits, hides and skins, woods, etc., to the United States, wheat, flour, and cotton to Sinaloa and Chihuahua, pearls to Europe and the United States; and the principal imports are machinery and implements for mining and agriculture, silk, cotton, linen and woolen goods, wines and liquors, arms and ammunition, and hardware. The total trade of the State may be estimated as worth from 6,000,000 to 8,000,000 pesos per annum.

The only railway traversing the State is the Guaymas and Nogales (Sonora) road, 422.302 kilometers in length, which, in Nogales (Arizona), connects with the Southern Pacific Railroad. The State has one street railway 3 kilometers in length, and the "Imuris Mining Company, Limited," owns another 18 kilometers long, and three concessions have been granted. Several fine wagon roads connect the different cities and towns with those of the adjacent States. Telegraphic, telephonic, and mail services are efficient and extended.

The principal industries are mining, agriculture, and commerce. There are a few manufacturing establishments, such as cotton and woolen mills, soap and candle factories, and distilleries.

Sonora is divided into 9 districts, subdivided into municipalities. The districts and their chief towns are as follows:

Altar, population 14,075, chief town El Altar, 2.16 kilometers from Hermosillo. This district is rich in mines.

Magdalena, population 13,846; the chief town, of the same name, is 150 kilometers from Hermosillo. The second town in importance is Nogales, on the boundary line between México and the United States, separated from the American town of the same name by a street only. It is the terminal point of the Sonora Railway and has a customs port.

Arizpe, population 13,465, also rich in minerals; its chief town, of the same name, is 219 kilometers distant from Hermosillo.

Moctezuma, population 13,782, rich in mines; its chief town, Moctezuma or Oposura, is 185 kilometers from Hermosillo.

Sahuaripa, population 11,460, a mineral district, the chief town of which, of the same name, is 323 kilometers from Hermosillo.

Alamos, population 50,939, a mineral district, with a chief town of the same name, which is the third city in the State and situated 309 kilometers from Hermosillo.

Guaymas, population 19,338, also a mineral district, possessing excellent coal beds; the chief town of which, Guaymas, is one of the most important commercial ports on the Pacific, 154 kilometers from Hermosillo. It is connected by rail with Nogales.

Hermosillo, population 28,094, very rich in mines; chief town, Hermosillo, is also the capital of the State, with 8,474 inhabitants, and situated 2,527 kilometers from the City of México, 281 from Nogales, and 144 from Guaymas. This city has many fine public buildings, among others the Mint, the Cathedral, a library, and the Government Palace. It is one of the railroad stations of the Sonora Line.

Ures, population 26,292; chief town of the same name 76 kilometers from Hermosillo.

The State of Tabasco, population 134,839, whose capital city is San Juan Bautista, population 9,604, lies in the southeastern part of the Republic, its boundaries being the Gulf of México on the north, the State of Campeche on the east, Chiapas on the south, Veracruz on the west, and the Republic of Guatemala on the southeast. Its area is 30,000 square kilometers.

On the Gulf the coast line of the State extends for 200 kilometers, and is low and healthful, the natural depression of the soil forming several lakes. There are no capes, bays, or sheltered harbors along the coast, but vessels find anchorage in the mouths of the rivers, called bars, the principal of which are the San Pedro and San Pablo, formed by the the river bearing that name at the boundary between Tabasco and Campeche; the Tabasco, Frontera, or Principal, formed by the Grijalva, giving access to the port of Frontera and the capital of the State; the Chiltepec, which is the widest and deepest of all, formed by the Gonzalez River, and the Tonalá, formed by the river Tancochopa, the boundary between Tabasco and Veracruz.

The surface of the State is generally a plain, slightly broken by hillocks and river beds, except toward the south and southeast, where a spur of the Sierra Madre rises. The highest mountains are the Ixtapangajoya, the Coconá, Puyacatengo, Madrigal, Quemado, Tortuguero, Limón, and Chinal.

Of all the States of México, Tabasco possesses the best hydrographic system. Two large basins, the Usumacinta and the Grijalva, collect the innumerable streams. The Usumacinta River is formed by the junction of the Pasión and Salina rivers (both entering from Guatemalan territory), and is afterwards joined by the waters of the Cha-

jill, Jataté, Lacantán, Cendales, and others. This river is 800 kilometers in length, and navigable 300 kilometers from its mouth for good-sized steamers. The Grijalva River is formed by the confluence of the Mexcalapa and the Sierra, or Tacotalpa. The former rises in the State of Chiapas, and receives throughout its extent more than 30 streams, and is navigable for 125 kilometers. The Tacotalpa also takes its source in Chiapas, and has numerous tributaries. The Grijalva proper commences with the junction of these two streams, and empties into the Gulf of México, and is navigable from the Frontera bar as far as Las Palmas, a distance of 280 kilometers. Other rivers are the Cuxcuchopa, navigable for 60 kilometers, the Soledad, Cocohital, Tular, Tortuguero, and Tonalá.

As has been stated, the general character of the land being a plain, with little slope seaward, the rain waters form many lakes, the principal are Matillas, Chichicastre, Zapote, Viento, Ramón, Bernete, Palo Alto, Ballo, Largarten, Encantada, Veladero, Chimal, and Puerto Cabello.

The climate is hot, tempered, however, by the numerous streams. Rainfall is abundant, and the temperature during the summer months (February to May) is from 27° to 28° C. (80° to 82° F.), and in the coolest months (December and January) the mean temperature is from 17° to 18° C. (62° to 64° F.). The prevalent diseases are malarial fevers and dysentery.

The fauna and flora of the State are both rich and varied, including all the species found in other parts of the Republic situated in the same zone.

Agriculture, and the industries directly derived from it, constitutes the source of future development, the soil, on account of its topography, is peculiarly rich in spontaneous vegetation. The work¹ from which the data referring to the State of Tabasco are obtained states that the agricultural production amounts in value to 8,000,000 pesos annually, of which 6,000,000 represents the home consumption and the remainder export values. Throughout the State 20,000 men are engaged in farming, 6,000 of whom are plantation owners. The leading products are cacao, sugar cane, coffee, tobacco, corn, rice, fruits, rubber, pepper, vanilla, cedar, mahogany, logwood, and other dye and cabinet woods. According to the "Anuario Estadístico" for 1897, the number of plantations in Tabasco was 370, divided as follows: Cacao, 124; coffee, 8; sugar cane, 44; cereals, 60; tobacco, 12, and 122 cattle ranches. The production was: Cereals, \$680,890; sugar-cane products (direct), 2,470,061 kilograms, at \$329,025; rum, 18,459 hectoliters, at \$277,336; logwood, 9,960,692 kilograms, at \$198,631; cacao, 418,033 kilograms, at \$498,898; coffee, 70,114 kilograms, at

¹ *Reseña Económica del Estado de Tabasco*, by Alberto Correa, 1899.

\$49,482; tobacco, 77,300 kilograms, at \$54,730; rubber 84,199 kilograms, at \$149,068; and chicle, 402,469 kilograms, at \$180,223.

Stock raising, notwithstanding the great facilities offered by nature, is not as flourishing as should be. The number of cattle being estimated by Correa at about 150,000 head.

Mining receives practically no attention, no precious minerals being found within the limits of the State, but there are indications of deposits of coal, asphaltum, cinnabar, and petroleum.

Commerce is well developed, there being, according to the authority above cited, 500 commercial houses, representing a capital of \$4,000,000, established throughout the State. Foreign trade through the port of Frontera during 1897-98 amounted to \$540,000 silver for imports and \$810,191 for exports, a difference of \$270,191 in favor of the exports. A large share of the trade in dye and cabinet woods seems to be carried on through the port of Carmen, amounting in value to \$300,000, which would increase the export trade of the State to over \$1,200,000 yearly. The leading articles of export are dye and cabinet woods, hides and skins, coffee, tobacco, and rubber. Coastwise and local trade is estimated at a valuation of \$1,560,000 for imports and \$1,920,000 for exports, thus giving \$5,400,000 as the total for both foreign and domestic trade.

Tabasco has no steam railways, but there are three lines of horse cars, one from San Juan Bautista to Carrizal, about 6 kilometers in length; one from Cárdenas to Paso de Cárdenas on the Grijalva River, 7 kilometers, and one (the Interfluvial) between San Juan Bautista and Boca Nueva, 6 kilometers in length. Other lines are projected, among them one to run from Cárdenas to Barra de Dos Bocas, 80 kilometers, and another from Teapa to La Ermita. Wagon roads and mule paths lead to all the principal centers, and there is a daily improving river transit system, 16 steamers being at present employed in this means of communication. Efficient and extended telegraphic, mail, and telephonic service is available.

The principal manufacturing industries are the development of sugar-cane products, yielding over \$500,000 annually; the manufacture of cigars and cigarettes, and the production of brick, soap, candles, and chocolate.

Politically the State is divided into 17 municipalities, subdivided into rural districts (*Vecindarios rurales*), as follows:

Balancán, population 3,043; Cárdenas, 7,850; Comacaleo, 10,169; Cunduacán, 9,364; Huimanguillo, 11,254; Jalapa, 8,236; Jalpa de Méndez, 4,599; Jonuta, 3,687; Macuspana, 12,135; Montecristo, 2,144; Nacajuca, 9,714; Paraíso, 4,912; Tacotalpa, 4,861; Teapa, 6,319; Tenosique, 2,683, their chief towns bearing the same names; also Frontera, population 6,794, and San Juan Bautista, 27,075, which are the principal municipalities, the former having, as the capital, the port of

Frontera and the latter, San Juan Bautista, which is also the State capital, containing 9,604 inhabitants. This city has tramway lines and many fine buildings, among them the Palace of the Legislative and Executive powers, hospitals, a theater, and three churches.

The State of Tamaulipas, population 206,502, whose capital city is Ciudad Victoria, population 14,774, is a favored land, requiring only more general irrigation and capital to develop its immense wealth. It is bounded on the north by the Rio Bravo, which separates it from the State of Texas (U. S. A.), on the northwest by Coahuila, on the west by Nuevo Leon, on the south by San Luis Potosí, on the southeast by Veracruz, and on the east by the Gulf of México. The area of the State is 83,234 square kilometers, and its population 208,102 inhabitants.

Tamaulipas occupies one of the most beautiful sections of the Republic. Its coast line stretches from the bar of the Rio Bravo on the north to Tampico on the south, an extent of 440 kilometers, being formed by a succession of sand banks. This part of the State is almost uninhabited, as with the exception of two or three unimportant villages the centers of population are from 8 to 12 kilometers inland. There are several bars, the principal being the Jesús María, at the junction of the Madre Lake and the Gulf of México, which is 800 meters wide and 15 feet below the level of the water at high tide; the Tampico bar, at a depth of from 8 to 9 feet; the Soto de Marina bar and the bar of the Rio Bravo. The prevailing winds on the Gulf coast are from east, northeast, and southeast, but in winter "northers" are frequent and dangerous.

The southern and central portions of the State are mountainous, the northern part containing extensive fertile plains, adapted for stock raising. The principal mountain ranges are the Pamoranes, separated from the San Carlos range by 25 to 29 kilometers, and the Sierra Madre, which traverses the southwestern, western, and central portions, its principal peaks being Cerro Mocho and Cerro Shigüe. The most remarkable valley, by reason of its beauty and fertility, is the Jaumave; others are the Rusias and the Santa Bárbara de Ocampo.

Tamaulipas has four large rivers which may be made navigable; also several small lakes and many small streams. The principal rivers are the Rio Bravo del Norte, the boundary line between México and the United States, flowing from northwest to southeast, and emptying into the Gulf of México; the Conchas, also called the Presas; the Soto de la Marina, navigable for 50 kilometers from its mouth, and the Guayalejo, with their respective tributaries. The most important lakes are on the Gulf coast, and are the Laguna Madre, 210 kilometers in length, containing several small islands; the Pesquerías, or Morales, 34 kilometers long, also containing small islands; the Tordo, San

Andrés, Chairel, Champayán, and Carpintero. Mineral springs abound.

The climate of Tamaulipas is generally hot and damp on the coast and in the vicinity of the lakes and rivers; temperate on the slopes of Sierra Madre and in the valleys, and dry and temperate in the Lágri-mas Valley. Rainfall is abundant in the sierras and moderate in the valleys, and throughout the district watered by the Rio Bravo frost is frequent. The highest temperature experienced in the State is from 32° to 33° C. (89° to 91° F.), and the lowest 15° to 24° C. (59° to 75° F.), the extremes being at noon and midnight. The prevailing diseases are malarial fevers and affections of the respiratory and digestive organs.

The fauna and flora are rich and varied and present the same general features as mark that of other Mexican States.

Agricultural products are, in the main, such as exist elsewhere in the Republic, cereals, leguminous plants, sugar cane, coffee, tobacco, cotton, and maguey. Official figures for 1897 credit the State with 76 plantations as follows: Cotton, 3; sugar cane, 28; cereals, 23; and 22 cattle ranches, the valuation of their production being given at \$46,129 for cereals; 3,470,642 kilograms of sugar-cane products at \$293,362; \$40,842 for rum; \$28,046 for mescal; 3,349,600 kilograms of ixtle at \$224,288, and 277,156 kilograms of cotton at \$82,452.

Although the mineral wealth of the State is most abundant, it has not been developed to any extent. The minerals found are gold, silver, iron, and copper; also salt, marble, and asphalt. The commercial future of Tamaulipas is assured by reason of its excellent ports, its close proximity to the United States, its railroad lines and natural wealth; its present disadvantages being limited to a lack of population and adequate capital and to restricted means of foreign communication. Tamaulipas and Nuevo Leon are the principal mercantile centers, the exports of the former town consisting of beef cattle, horses, ixtle, sarsaparilla, woods, fruits, hides and skins, rubber and asphalt, while the imports are plows, machinery, arms, hardware, alimentary products, wines and liquors, cotton, silk and woolen goods, etc. The frontier of this State bordering on the United States belongs to the Free Zone.

Three railroad lines traverse the State, the Mexican National, the Monterey and Gulf, and the Mexican Central. The first-mentioned line crosses it twice, first in the northwest, on the International Line from México to Nuevo Laredo, and again in the north, on the Matamoros, San Miguel and Monterey Line. The Monterey and Gulf Line crosses it diagonally from west to northeast on the Monterey, Tampico and Treviño road, and the Mexican Central on the line from Tampico to San Luis Potosí. The Central also has a line from Chica-

lote to Tampico. There are three lines of tramways in Matamoros, one in Nuevo Laredo, one in Victoria, one in Tampico, and another connecting this port with the capital. Concessions have also been granted for several more lines. Telephone, telegraph, and mail service is efficient and extended. Several steamship lines touch at Tampico, the principal being the Hamburg-American, the Harrison, the West India and Pacific, and the New York and Cuba Steamship Company. Wagon roads are numerous, but their condition leaves much to be desired.

Besides manufactured products directly derived from agriculture, such as sugar, rum, etc., the State also has beer, soap, and candle manufactories.

Tamaulipas is divided into 4 districts, subdivided into 38 municipalities. The districts and their principal cities are follows:

Distrito del Norte, population 66,197, its chief town is Matamoros, population 17,564, 293 kilometers from Victoria, the State capital. This is a fluvial port, on the Rio Bravo, 50 kilometers from the Gulf coast and carries on a large trade. It is a fine city, possessing many public buildings, tramway lines, etc. Next in importance comes Nuevo Laredo, on the Rio Bravo, opposite the American town of the same name (Texas), with which it is connected by an iron bridge. It has a frontier customs port, and is the second customs district of the Republic. It is distant 547 kilometers from the City of México by rail and 320 from Matamoros. Other important towns are Guerrero and Mier, also frontier customs ports, and Reynosa and Camejo.

Distrito del Centro, population 55,157, whose chief town, Ciudad Victoria, is also the State capital, containing 14,774 inhabitants, and distant 1,367 kilometers from the City of México by rail; 550 from Nuevo Laredo, and 233 from Tampico. The city possesses fine public buildings, tramways, and other modern improvements, and as it lies on the line of the Monterey and Gulf Railway, it has a large trade. Other important towns are Soto de la Marina, a fluvial port, 63 kilometers from the Gulf, the river from which it takes its name being navigable for more than 141 kilometers, Villagrán, San Carlos, and Hidalgo.

Distrito del Sur, population 37,000; its chief town, Tampico, population 11,912, a Gulf port, is steadily growing in importance. Its custom-house receipts up to the end of November, 1899, were larger by a considerable sum than those of the great port of Veracruz. The Panuco River, which flows by it, waters one of the most valuable sections of the territory of the Republic, where agriculture and stock raising offer inducements not equaled elsewhere in the country. The navigation business on this river is constantly increasing, and it is stated that a French company is investing \$1,000,000 in the sugar industry in the district. A company organized about a year ago in Chicago,

Ill., recently bought a tract of 8,000 acres of land within 9 miles of Tampico, where it will be engaged in the culture of tropical products.

The city possesses several fine public buildings, tramways, and all modern conveniences, and is the terminus of two railroad lines, the Monterey and Gulf and the Mexican Central. Other important towns are Altamira, Aldama, Nuevo Morelos, and Quintero.

Cuarto Distrito, population 48,148; its chief town is Tula, population 19,421, 160 kilometers from Victoria, and one of the principal commercial centers of the State. Other towns are Ocampo, Jaumave, Palmillas, and Bustamente.

The State of Tlaxcala, population 166,803, with a capital city bearing the same name, is the smallest State in the Republic. Its boundaries are the State of Puebla on the north, east, and south, and México on the west, its area measuring 4,132 square kilometers.

Tlaxcala is situated within the cold region of México, and its valleys, though sandy, are fertile. It forms a portion of the Central Plateau, being situated over 2,000 meters above the level of the Gulf. The eastern slopes of the Popocatepetl range rise in the west of the State, while toward the south rises the Malinche range with its snow-capped peaks, Malintzi, 4,107 meters in height, and the Xaltonale, 3,848 meters high. The highest points in the eastern portion of the State are Peñón del Rosario, 3,359 meters, and Huitintepec, 3,080 meters high. Other elevated points throughout the State range from 2,000 to 2,700 meters in height. The principal valleys are the Huamantla, the Pié Grande, Apam, and Zahuapam.

The principal rivers are the Zahuapam, emptying into the Atoyac, and the Atoyac and its few tributaries. There are also several permanent streams, among them the Negros, Tenexac, Achiachiapam, Totólac, and Tequixquiati. The principal lakes are the Acuitlapilco, 105 hectares in extent, Rosario, 252 hectares, Xonecuila, and Santa Clara.

The climate of the State is cold and healthful, as its mean altitude is between 2,000 and 3,000 meters above sea level. Rainfall is moderate throughout the year and frost is frequent during the winter. The prevailing diseases are typhus and malarial fevers and affections of the respiratory organs.

The fauna and flora embrace the usual species indigenous to the Mexican States.

Tlaxcala is essentially an agricultural State, cereals and pulque forming the chief products. Official figures for 1897 credit it with 154 plantations, devoted in the following proportions to various cultures: Cereals, 100, and maguey, 48; and 6 cattle ranches. The valuations are given as—cereals, \$2,282,847; maguey products (pulque, mescal, and tlachique), 458,189 hectoliters, at \$498,307.

The State has no importance as a mining district, though gold, silver, lead, cinnabar, and a small proportion of coal have been found.

The value of the annual commerce is estimated at about \$8,000,000, consisting chiefly in the export of pulque to the City of México and to Puebla and adjacent States; of cereals and other agricultural products, paper and cotton from the native mills, flour, etc., the principal imports being alimentary products, hardware, furniture, machinery, and agricultural implements.

Three railroads cross the State—the Mexican, running on the México and Veracruz line and on the Apizaco and Puebla branch; the Inter-oceanic, from Acapulco and Veracruz to México, and the Santa Ana and Tlaxcala road, from Chiantempan to Tlaxcala. There are several wagon roads in good condition leading to the adjacent States. Postal, telegraph, and telephone service is good and extended.

The principal manufacturing establishments of the State are its cotton and print mills, a glass factory, and several foundries.

The political divisions of the State are 6 districts, subdivided into municipalities. The districts are:

Ocampo, population 20,037; its chief town is Calpulálpam San Antonio, on the Interoceanic Railroad, 60 kilometers from the State capital.

Morelos, population 17,949; its chief town is Tlaxco San Agustín, 42 kilometers from Tlaxcala.

Juárez, population 36,295; its chief town, Huamantla, is 38 kilometers from Tlaxcala.

Zaragoza, population 35,941; its chief town, Zacateco Santa Inés, 12 kilometers from Tlaxcala.

Hidalgo, population 38,636, whose chief town, Tlaxcala, the State capital, with 2,847 inhabitants, is also the most important town in the State, possessing many fine buildings, and having rail connection with the City of México.

Cuauhtemoc, population 17,915; its chief town is Barrón-Escandón, or Apizaco, situated on the line of the Mexican Railroad, 26 kilometers east of Tlaxcala.

The State of Veracruz-Llave, population 866,355, whose capital city is Xalapa, or Jalapa, population 18,168, is considered one of the richest and most beautiful regions of the globe. Its area is 71,116 square kilometers, the boundaries being Tamaulipas on the north, San Luis Potosí, Hidalgo, and Puebla on the west, Oaxaca on the south, and the Gulf of México on the east. Veracruz occupies a narrow strip of land rising gradually from the coast line to the crest of the Sierra Madre Mountains. Almost the entire section is mountainous, the Sierra Madre range occupying the western central portion, running from north to south, and rising to the height of 4,089 meters above sea level in the peak of Nanchampetl, or Cofre de Perote. To the south is the

majestic snow-capped volcano Citatepetl, or Orizaba, 5,295 meters above the level of the sea. Other ranges are the Maltrata, Alcuengo, Jalacingo, Oxocupan, and Zongolica.

The eastern litoral, bordering on the Gulf of México, is 700 kilometers in extent, stretching from the Tampico Bar to Tonalá. The northern section of this coast line is called the Windward coast, while to the south, from Veracruz to the bar of Tonalá, is the Leeward coast. The shore line is broken by numerous bars, shoals, islands, capes, etc.

Hydrographically the State may be divided into two basins, the northern extending from the Panuco River to the Rio Blanco, and the southern from the latter stream southward to Taucochapa. The rivers susceptible of navigable development are the Panuco, Tuxpam, Vinasco, Yautepec, Tecolutla, Nautla, Blanco, and Papaloápan, all having several tributaries and forming the hydrographic basins above mentioned. There are also several lakes, among them the Catemaco, Ostión, Mexcalapa, Tortuguero, and Tecunanapa.

The climate is very variable, being hot and unhealthy in the south and on the coast, yellow fever, dysentery, and black vomit prevailing; temperate and, at times, humid at altitudes of more than 1,000 meters; temperate and healthful on the mountain slopes; cold at an altitude of 1,500 meters, and hot in the north.

The fauna and flora of the State are both rich and varied, embracing the species usual in other portions of the Republic.

The agricultural products include all such as are indigenous elsewhere to México. Official figures give the State of Veracruz 751 plantations in 1897, divided as follows: Cotton, 23; coffee, 98; sugar cane, 106; cereals, 189; fruits, 3; tobacco, 45; woods, 8, and 279 cattle ranches. According to the same authority the valuation of the State products for that year were: Cereals, \$4,661,910; sugar-cane products (direct), 6,350,208 kilograms at \$657,587; rum, \$754,734; maguey products, \$21,680; cotton, \$503,717; ixtle, \$10,550; cacao, \$16,100; coffee, 14,302,714 kilograms at \$4,416,618; tobacco, 1,706,066 kilograms at \$462,762; and vanilla, \$191,040. Stock raising is also one of the sources of wealth and may be estimated at a value of from 24,000,000 to 25,000,000 pesos.

Many rich mines are included within the borders of the State, the principal yielding gold, silver, lead, iron, mercury, copper, coal, petroleum, asphalt, and marble, and also such precious stones as opals, agate, lapis lazuli, and amethysts.

Veracruz is one of the most important commercial sections of the Republic, its trade having outlets not only throughout México but also to the United States, Europe, the West Indies, and South America. The chief ports are Veracruz, Tuxpam, and Coatzacoalcas, devoted to foreign commerce, while the other gulf ports are open to coastwise

trade only. Exports from Veracruz cover almost all the articles that México sends abroad, while the imports are of an equally general character. The total trade of the port, both foreign and domestic, amounts to about \$100,000,000 per annum.

The railways include the Mexican line from Veracruz to México, the Interoceanic, the Veracruz and Alvarado, the Central in the north, the Córdoba and Tuxtepec, and two short lines, one from Veracruz to Antigua and one from Jalapa to Coatepec. Many fine highways also connect with the principal towns of the adjacent States. Maritime communication is effected by means of the several steamship lines touching at Veracruz and other ports, viz: The French Transatlantic, the Hamburg-American, the Royal Mail, the Harrison, the West India and Pacific, the Morgan, and the Ward lines. Coastwise steamers also ply between home ports. A cable line runs from Coatzacoalcas to Galveston, with stations at Veracruz and Tampico. Telegraph, telephone, and postal communication is efficient and extensive.

In addition to the industries directly connected with agriculture, mining, and stock raising, the State has many manufacturing interests, such as cotton, woolen, saw, and paper mills, and establishments for the manufacture of chocolate, wax matches, soap, candles, and cigars, and several foundries.

The State is divided into eighteen cantons, subdivided into municipalities. The cantons may be classed in two groups of nine each, called, according to their geographical position, maritime and interior respectively; they are subdivided as follows:

Northern maritime, embracing Ozuluama, population 37,656; Tuxpam, 47,944; and Papantla, 44,803, their chief towns bearing the same names, respectively, Tuxpam being a seaport open to foreign trade.

Central maritime, embracing Misantla, population 17,610, whose chief town bears the same name; Jalapa, 73,786, the chief town of which is Jalapa, also the capital of the State, with 18,168 inhabitants, situated 310 kilometers from the City of México and 118 from Veracruz, being the principal town of the State, the center of a fine agricultural district, and possessing fine public buildings; and Veracruz, 92,453, whose chief town bears the same name and is the first commercial port of the Republic, 424 kilometers from the City of México. The chief public buildings of the city of Veracruz are the municipal palace, the People's Library (containing over 20,000 volumes), a theater, several churches, and the Artillery School. This city is in constant communication with the principal ports of the United States, Europe, and the West Indies by means of a submarine cable and steamship lines. The population is about 24,085 inhabitants. It is the seat of the Chamber of Commerce, has a Consular corps, and is equipped with two light-houses, street railways, and other modern conveniences.

Other towns in the canton are Alvarado and Tlacotalpam, the latter a fluvial port on the Papaloapam River.

Southern maritime, embracing Los Tuxtlas, population 41,735, the chief towns being San Andrés de Tuxtla and Santiago de Tuxtla; Acayucam, population 33,111, its chief town bearing the same name; and Minatitlán, population 28,304, with its chief town bearing the same name, a railway station. Coatzacoalcas, a gulf port and the third town in the State, is also in the canton of Minatitlán.

Northern interior, embracing the cantons of Tantoyuca, population 52,079, and Chicontepec, 53,207, their chief towns bearing the names of the cantons.

Central interior, embracing Jalacingo, population 60,729; Coatepec, 47,667; Huatusco, 31,298; Córdoba, 73,139; Orizaba, 76,657; and Zongolica, 25,625, their chief towns bearing the same names as their respective cantons. Orizaba, population 31,512, deserves especial mention as the second city in the State.

Southern interior, comprising the canton of Cosaloápam, 28,552, with its chief town bearing the same name.

The State of Yucatán, population 298,850, whose capital city is Mérida, population 36,935, is the greatest henequén-producing region of the world. It is bounded on the north by the Gulf of México, on the east by the Caribbean Sea, on the south by British Honduras and Guatemala, and on the west by the State of Campeche. It comprises an area of 9,120 square kilometers and its population numbered, in 1895, 298,039, but according to official data received December 1, 1899, it had increased to 308,493 on the latter date.

The peninsula of Yucatán is an immense plain, which, starting from the coast line, rises gradually toward the interior to a height of from 40 to 60 meters. In the northwest, where Mérida is located, the soil is of a calcareous, dry, and rocky formation, and until the culture of henequén transformed it into one of the richest regions of México, it was proverbially sterile. The fertility of the land increases toward the northeast, while the southeast section offers great natural opportunities for wealth, abounding as it does in virgin forests filled with valuable dye and cabinet woods and in stretches of land suitable for the culture of all the vegetable species. This territory is, however, occupied by rebel Indian tribes and has not been accessible to progress and civilization for more than fifty years.

There are two small mountain ranges in the State; the one, called Puc in the Maya tongue, is so uniform in its extent and at so slight an elevation above sea level that it might more properly be termed an elongated hill. This range, which starts near the partido of Macanú, extends toward the east, thence in a southerly direction, after which it turns SSE. for a distance of 120 kilometers, gradually

decreasing in altitude until, near Peto, it merges into a savanna or plain. The other range is formed by a series of hills starting near the coast. Several islands lie along the coast, viz, Pájaros and Perez to the north; southwest of these is Arenas, while near Cape Catoche are Halboy, Contoy, and Blanca, and off the western coast are Mujeres, Cancun, and Cozumel. Small cays, which are dangerous for navigators, abound in the vicinity of Cape Catoche. Mujeres Island, however, possesses a fine harbor, which with the port of Progreso (open to foreign traffic) and the ports of Cozumel, Halboy, Celestún, Telchal, Chicxalub, Chuburná, Santa Clara, Kxilam, Bravo, and Sisal are the principal coast towns. Sisal is at present almost deserted, though it was formerly the chief port of the State.

The coasts of Yucatán are very low, and, judging from the shells found among the rocks and in deep diggings, the entire peninsula was at one time covered by the sea. There are no rivers, and all drinking water is obtained from natural wells sunk to a greater or less depth. The so-called Lagartos River is in reality a shallow arm of the sea, and is remarkable for the fact that at a distance of about 400 meters inland pools of fresh water spring up amid the salt. These are called "Bocas de Conil," and are supposed by Humboldt to be due to immense hydrostatic pressure from the interior of the earth. Such springs are also found on the Windward coast. Throughout the State are many springs called locally *sartenejas*, *aguadas*, and *cenotes*, the first being deposits of rain water among the rocks; the second large reservoir-like pools, some of them having been constructed by the ancient inhabitants, and the third beautiful caverns where water is found in immense quantities.

The only lake is the Chichankanab, SE. of Mérida, about 32 kilometers distant from Peto, the peculiar characteristic of which is that the waters, though beautifully clear, are very bitter, and that the bed is composed of crystals closely resembling Epsom salts.

The climate is generally pleasant, the maximum temperature in summer being 32° C. (89° F.) and the minimum in winter 19° C. (66° F.), the summer heat being tempered by cool breezes. Malarial and other fevers are the prevailing diseases.

The fauna of the State embraces almost all the species found throughout the Republic, while the flora is no less rich and varied.

The principal sources of agricultural wealth consists in the cultivation of henequén, but in the northwest section there are a few sugarcane plantations, while in the northeast or forest region dye and cabinet woods, chicle gum, tobacco, and vanilla are grown. Mexican official figures for 1897 give Yucatán 826 plantations, divided as follows: Sugar cane, 94; cereals, 159; henequén, 348; and 225 cattle ranches. The principal products for the same period are estimated as follows: Corn, 2,873,488 hectoliters at \$5,743,255; beans, 74,715 hec-

toliters at \$362,627; sugar-cane products (direct), 5,570,539 kilograms at \$487,182; rum, 52,644 hectoliters at \$534,582; henequén, 47,042,134 kilograms at \$6,932,327; logwood, 26,867,423 kilograms at \$1,018,387, and tobacco, 110,750 kilograms at \$50,829. In 1898 the extent of cultivated lands throughout the State is given officially as 54,564 hectares, of which 21,835 were devoted to corn.

There are no mines in the State; it, however, possesses several kinds of building stones, clay, gypsum, etc.

Stock raising, though carried on to a considerable extent, does not meet the requirements of home consumption, large quantities of cattle being imported from the adjacent States, especially from Tampico. The "*Boletín de Estadística*," an official publication issued by the State, estimates the yearly importation of beef cattle at 7,000 head.

The foreign trade of Yucatán is carried on almost exclusively through the port of Progreso. According to a Belgian consular report,¹ the imports at this port in 1898 amounted to \$1,866,110 gold, of which 30 per cent is credited to the United States. The value of exports declared at the Progreso custom-house amounted to about \$9,200,000. The principal items of import are animal, vegetable, mineral, textile, and chemical products, wines and liquors, papers, machinery, carriages, arms, and ammunition. Henequén alone was exported during that year to the amount of 418,972 bales, weighing 68,834,268 kilograms, according to the authority above quoted, which also gives the following data in regard to the exports of the same fiber in 1899: To the United States, 428,084 bales (70,171,643 kilograms); to Europe, 11,263 bales (1,902,112 kilograms), and to Cuba, 6,631 bales (1,117,141 kilograms), aggregating 445,978 bales, or 73,190,896 kilograms.

The railways of the State are: The Mérida and Progreso, 36 kilometers; the Izamel, 66 kilometers; the Mérida and Valladolid, with a branch to Progreso, 78 kilometers; the Mérida and Peto, 127 kilometers, running to San Antonio, and the Peninsular road from Mérida to Campeche, 173 kilometers. In May, 1899, a company was organized under the name of the Yucatán Southeastern Company, with a capital of \$1,000,000, Mexican silver, to open up vast uncultivated regions in the old Maya peninsula. There are also 36 kilometers of street railways in Mérida, and several wagon roads. Maritime communication is carried on by means of the New York and Cuba Mail Steamship Company, the Imperial German Mail, the Harrison Line, the West India and Pacific Steamship Company, the Spanish Transatlantic Line, two Mexican lines, the Prince Line, the Johnston Line, and others. Telegraphic, telephonic, and mail services are efficient and extended.

¹Recueil Consulaire, tome 104, p. 351, 1899. Bruxelles.

The principal industry of the State is the manufacture of henequén ropes and bags. An American firm has established a factory for the preparation of vegetable pepsin from the *papaya* (*carica papaya*).

Politically, Yucatán is divided into 17 partidos, subdivided into municipalities. The partidos are:

Acanceh, population 22,952; its chief town, bearing the same name, is situated 25 kilometers by rail from Mérida, the State capital.

Espita, population 10,216, with a chief town bearing the same name.

Hunucmá, population 19,216, with a chief town bearing the same name, is 36 kilometers by rail from Mérida, the port of Sisal being also one of its towns.

Las Islas, population 2,303; chief town, Isla de Mujeres, a seaport. The two other ports of the partido are Cozumel and Halboy.

Izamal, population 22,039; chief town, bearing the same name, is 66 kilometers from Mérida.

Maxcanú, population 19,630; its chief town of the same name is 58 kilometers from Mérida, the port of the partido being Celestún.

Mérida, population 53,856, whose chief town, Mérida, is also the capital of the State, containing 36,935 inhabitants, according to the official census of 1895. This is one of the richest cities of the Republic, possessing handsome buildings, street railway lines, and all modern conveniences. It is also the railway center of the State.

Motul, population 18,118, with a chief town of the same name, 46 kilometers from Mérida, the port of the partido being Telchac.

Peto, population 8,465, with a chief town of the same name, is a railway terminus.

Progreso, population 6,057, whose chief town, Progreso, population 5,911, is 36 kilometers from Mérida. It is the principal port of the State and the second in the Republic for its import trade, the vessels calling there numbering yearly from 500 to 550, of which 350 are steamers. The port is not safe, especially in bad weather. Other ports in the partido are Chicxulub and Chuburná.

The other partidos are Sotuta, population 9,303; Tekax, 18,454; Temax, 16,934; Ticul, 24,529; Tixkokob, 13,831; Tizimín, 9,440; and Valladolid, 23,507, the chief towns of which bear the same names as their respective partidos.

The State of Zacatecas, population 452,578, the capital city of which is Zacatecas, with 39,912 inhabitants, is one of the important interior States of the Republic. Its boundaries are: Coahuila on the north, San Luis Potosí on the east, Jalisco and Aguascalientes on the south, and Durango on the west, its total area being 64,138 square kilometers.

Situated on the high Central Plateau of the Republic, this State is one of the most mountainous regions of the country, and is formed by the extension of the Sierra Madre range. Its mean altitude is 2,230 meters, the highest point being 3,090 meters and the lowest 1,573.

Owing to topographical conditions agriculture does not prosper throughout its extent. The principal mountains are Mazapil, Tecolotes, Novillos, Calabozal, Pichihualtepec, Pitiquitas, San Pedro, Tetillas, Mesquital, Melilla, Chacuaco, Chapultepec, and the peak of Teyra.

The two principal rivers are the Juchipila and the Nieves, respectively 230 and 225 kilometers in length. Other rivers are the tributaries of those above mentioned and the Jerez, the Tlaltenango, and Tenl. There are no large lakes, but pools of clear, cold water and mineral springs abound.

The State possesses three climatic regions, the first between 1,550 and 2,000 meters above sea level, the second from 2,000 to 2,400 meters, and the third from 2,400 to 3,000 meters, the thermometer ranging from 11° to 21° C. (about 52° to 70° F.), according to the altitude. Rainfall is abundant throughout the State, and the winds from the west are cold, while those from the southeast are warm. Fevers and pneumonia are the most common ailments.

Although the fauna of the State is not known very thoroughly, it may be said to embrace such species as are common to other parts of the Republic, the same being applicable to the flora.

As has been stated, Zacatecas can not be classed among the important agricultural sections of México. Cereals are, however, its best crop, sugar cane and maguey following.

Mexican official statistics for 1897 give the following data in regard to the State: Number of plantations 189, divided as follows: Coffee, 4; cereals, 80; maguey, 15; and 90 cattle ranches. The principal agricultural products for the same year are given as 1,268,704 hectoliters of corn, at \$2,822,336; barley at \$80,379; wheat, 3,989,350 kilograms, at \$200,571; sugar-cane products, 1,652,743 kilograms, at \$115,484; maguey products, 18,462 hectoliters, at \$144,398; grape wine to the value of \$22,853, and tobacco at \$45,469.

Stock raising forms one of the chief sources of wealth, the Zacatecas stock being renowned throughout the Republic, the sheep especially being considered unequaled, both on account of flesh and wool. Foreign stock has been imported to improve the native breeds, and the experiment has been eminently successfully.

From a mineral standpoint, this State is one of the richest regions in the world, as it contains the Sierra de Zacatecas, which has produced fabulous quantities of silver. Other minerals, found in greater or less quantities, are gold, mercury, iron, copper, zinc, lead, coal, bismuth, and salt.

Commercially Zacatecas is one of the most important centers of the Republic, its trade being estimated at about \$41,000,000 per annum, as follows: Imports, \$15,000,000; exports, \$19,000,000; local trade, \$7,000,000. The United States, Europe, and the City of México

receive the mineral exports, the former taking ores and the two latter silver bullion and coin. Other products, consisting chiefly of cereals, live stock, tallow, horns, bones, mescal, etc., go to the adjacent States. Imports from México City, the United States, and Europe comprise groceries, ready-made clothing, hardware, machinery, agricultural implements, arms, and ammunition.

The Mexican Central and the Mexican National railroads traverse the State, the former from SE. to NW. on the International line from México to Ciudad Juárez and on the Aguascalientes and Tampico line, and the latter on the Zacatecas and San Luis Potosí road. There is also a narrow-gauge road connecting Guadalupe and Zacatecas, as well as several wagon roads. Telegraphic, telephonic, and postal services are efficient and extended.

The principal manufacturing industries are the production of sugar, rum, and wine, the reduction of ores, and the manufacture of cotton, woolen, and knit goods, carriages, candles, soap, and chocolate.

The State is divided into 12 partidos, subdivided into municipalities. The partidos and their principal cities are:

Mazapil, population 17,964, an important mining section, the chief town of which bears the same name and is situated 336 kilometers from Zacatecas.

Fresnillo, population 54,512, the second agricultural and stock-breeding partido of the State, its chief town, Fresnillo, population 6,757, lies on the Central Railroad, 59 kilometers from Zacatecas.

Zacatecas, population 80,506, one of the richest silver-bearing districts in the world, its chief town bearing the same name, being also the State capital, with 39,912 inhabitants. It is also one of the principal cities of the Republic, and is situated on the line of the Central Railway, 706 kilometers from the City of México, 1,130 from the port of Veracruz, 121 from Aguascalientes, and 787 from the port of Tampico. The city is equipped with all modern conveniences and possesses many fine public buildings, among others the Municipal Palace, the Mint, the Institute of Sciences, the Cathedral, and many churches, hospitals, schools, etc. According to old statistics the partido of Zacatecas yielded in the period from 1548 to 1832 minerals to the value of 667,343,299 pesos. Guadalupe, population 8,781, is the second town in the partido, being of considerable commercial importance.

Ojocaliente, population 18,838, the chief town of which, bearing the same name, is 34 kilometers from Zacatecas.

Pinos, population 51,763; its chief town, situated 125 kilometers from Zacatecas, bears the same name, and is rich in minerals and produces large quantities of maguey mescal.

Villanueva, population 36,934, is an agricultural region, the chief town of which, bearing the same name, is 50 kilometers from Zacatecas.

Juchipila, population 18,172, also an agricultural section, with a chief town, of the same name, is 251 kilometers from Zacatecas.

Nochixtlan, population 18,499, with a chief town, of the same name, is 246 kilometers from Zacatecas.

Tlaltenango, or Sánchez Román, population 37,361, is a mining region; its chief town, bearing the same name, is 202 kilometers from Zacatecas.

Jerez, population 50,253, is the first agricultural section in the State, its principal town, of the same name (called also Ciudad García), is situated 50 kilometers from Zacatecas.

Sombrerete, population 38,390, is a fine mining region, the chief town, of the same name, being situated 88 kilometers from Zacatecas, the town of Chalchihuites ranking next in importance.

Nieves, population 29,386, the principal towns of which are Nieves, 185 kilometers from Zacatecas, and Rio Grande or González Ortega, at a distance of 164 kilometers.

The Territory of Baja (Lower) California, population 42,245, is a peninsula extending from north to south into the Pacific Ocean for a distance of over 1,500 kilometers, its boundaries are the State of California (United States) on the north, the Gulf of California on the east, and the Pacific Ocean on the west and south. The total area is 155,200 square kilometers.

The coast line measures 3,000 kilometers, bordered by a number of islands. The principal bays where the ports open to foreign commerce are found, are: La Paz and Santa Rosalía on the Gulf of California, and Ensenada Bay on the Pacific. Others worthy of note are San Quintín, San Sebastián, Vizcaino, San Pablo, San Roque, Asunción, Magdalena, Ballenas, Pequeña, and Almejas on the western or Pacific side, while on the gulf or eastern coast are San Felipe, San Luis, Remedios, Angeles, Animas, San Carlos, Concepción, San Nicolás, San Basilio, Ventana, Muertos, Palmas, and San José. The large islands also have their ports and bays, as follows: Angel de la Guarda Island contains the port of Refugio and Humbug Bay; Carmen Island, ports Lobos and Balandra and the bays of Salinas and Gavilanes, and San José Island the Bay of Amortajada, and Cedros Island the Bay del Sur. Other islands on the Pacific coast belonging to the Republic are: Guadalupe, which is extremely fertile and rich in cattle; Todos Santos, San Martín, San Gerónimo, Sacramento (a reef), Elide, Cedros, Natividad, San Benito, Asunción, and the large islands of Magdalena, Santa Margarita, and Crecientes. On the gulf side are Montague and Gore at the mouth of the Colorado River, Gonzaga (a reef), the San Luis Islands, the large island of Angel de la Guarda, the Mejía Islands, San Marcos, Carmen, Santa Catalina, San José, Espiritu Santo, Cerralbo, and several others.

The peninsula is traversed from end to end by a cordillera run-

ning nearer the eastern than the western coast, the descent on the gulf side being extremely abrupt, while on the Pacific side the coast is reached by a succession of low hills. This mountain chain possesses remarkable topographical and geological features, in some places granite, occasionally metalliferous, forming the central portions. Another differential characteristic between the mountains of Upper and Lower California are the rocks of volcanic origin which occupy a large extent of the territory, giving the country a marked aspect of aridity and desolation, this being especially noticeable in the northern part of the territory, which is occupied by the Cupapás chain and the Volcano de las Vírgenes. The highest granite peak is the Cerro del Gigante, near Loreto, on the gulf coast, the altitude of which is estimated at 1,300 meters above sea level.

With the exception of the Colorado River in the north and several small streams in the center and south, among which are the Mulejé, Todos Santos, San José, Miraflores, and Purísima, the peninsula is lacking in means of irrigation.

The climate is hot and dry in the north and temperate toward the south.

Lack of irrigation and scarcity of rainfall are the causes of the general sterility of the soil and the consequent limitations of agricultural development. Notwithstanding this, however, there are in some portions of the peninsula spontaneous productions of the soil which yield large profits. Principal among these is the archil, or Spanish moss, used for dyeing purposes, which grows profusely throughout an extensive belt between $23^{\circ} 22'$ and $26^{\circ} 24'$ north latitude on the west coast. It is not found on the eastern or gulf side, but its growth begins again, though to a limited extent, on the coasts of Sonora and Sinaloa. Henequén is found in the central regions of the peninsula and hemp in the north near the Colorado River. Flowers and ornamental shrubs of all the tropical species grow wild, while cabinet and dye woods are also found. Like the flora, the fauna of the territory is limited, the species known being similar to those of the northern Mexican States. On the western coast the sperm or oil whale and otter are found. The Gulf of California abounds in shells and pearls from Mulegé to Cape Porfía, while seals are found in the waters of Tiburón, Angel de la Guarda, and San Lorenzo islands.

Sugar cane and tropical fruits are successfully cultivated in the humid sections, and the grape also receives some attention. The "Anuario Estadístico" for 1897 estimates the number of plantations in the Territory as 30, divided as follows, according to the principal product: Sugar cane, 10; cereals, 13; maguey (mescal), 1; and cattle ranges, 6; the production of which is estimated as follows: Barley, 2,050 hectoliters, valued at \$10,270; corn, 8,648 hectoliters, at \$37,385; wheat, 2,838,947 kilograms, at \$171,556; leguminous products, 2,739 kilos,

at \$20,504; sugar-cane products, 1,819,946 kilos, at \$99,357; mescal rum, 235 hectoliters, at \$8,463; cotton, 30,429 kilos, at \$2,112; grape wine, 7,516 hectoliters, at \$30,712, and tobacco, 32,780 kilos, at \$8,399.

The number of head of live stock, according to the latest available figures, is 113,027, as follows: Cattle, 76,137; horses, 7,760; mules, 4,319; asses, 2,584; hogs, 5,379; goats, 12,153, and sheep, 5,295.

The principal mineral products of the peninsula are gold, silver, copper, lead, gypsum, and coal. Physically the Territory might be divided into three sections: the northern, or gold bearing; the southern, or argentiferous, and the central, or copper region. Silver and other minerals are found here. The former name of the territory was Real de San Antonio. West of this, in the same cordillera, is Mineral del Triunfo, the site of very important reduction works. In the municipalities of La Paz, San Antonio, Santiago, Mulegé, Comandú, and Ensenada, gold is found; silver in San Antonio, La Paz, Todos Santos, Santiago, San José del Cabo, Mulegé, and Comandú, and copper is most abundant in La Paz, San Antonio, Todos Santos, Mulegé, Comandú, and Santa Rosalía, the latter being the most important mining region. It is south of La Paz, and its many mines were first worked by the Jesuits in 1700. The mines of this section in exploitation yield about 200,000 tons of metal annually. Lead is found in San Antonio and Mulegé, and coal in Santiago. There are abundant salt deposits, the principal being the "Ojo de Liebre" on the western coast, and those of the islands of El Carmen and San José on the east.

In addition to the several high roads and mule paths, the Territory contains two steam railways, one belonging to the El Progreso Mining Company and the other to the Bolco Mining Company, the former in Triunfo and the latter in Santa Rosalía, and measuring 10 and 3.5 kilometers in length, respectively.

Several lines of steamers ply between the ports of the peninsula, six Mexican vessels and one American being engaged in this coast trade. Telegraphic and mail communications are efficient, but telephone service is not very extended.

Besides the industries directly derived from agriculture and mining no manufactures of any importance are established in the Territory.

Lower California is divided into two districts, the northern, population 7,452, and the southern, with a population of 34,793. This latter is subdivided into two partidos and seven municipalities; the Partido Sur consisting of the municipalities of La Paz, San Antonio, Santiago, San José, and Todos Santos, and the Partido Centro of Mulegé and Comandú. The principal city is La Paz, which is the capital of the southern district, containing 4,737 inhabitants. Its principal commerce is done with San Francisco, Mazatlán, Guaymas, San Blas, and Manzanillo. Ensenada de Todos Santos is the chief town of the northern

district, with 1,259 inhabitants. Other towns of importance are Santa Rosalía and those which bear the names of their respective municipalities.

List of the principal cities and towns of México, with their population, according to the revised census of 1895.

City or town.	State.	Population.
México.....	Federal District.....	329,774
Puebla.....	Puebla.....	88,684
Guadalajara.....	Jalisco.....	83,934
San Luis Potosí.....	San Luis Potosí.....	69,050
Leon.....	Guanajuato.....	58,426
Monterey.....	Nuevo Leon.....	45,695
Pachuca.....	Hidalgo.....	40,487
Zacatecas.....	Zacatecas.....	39,912
Guanajuato.....	Guanajuato.....	39,404
Mérida.....	Yucatán.....	36,935
Querétaro.....	Querétaro.....	34,576
Morelia.....	Michoacán.....	33,890
Oaxaca.....	Oaxaca.....	32,437
Orizaba.....	Veracruz.....	31,512
Aguascalientes.....	Aguascalientes.....	30,872
Saltillo.....	Coahuila.....	26,801
Durango.....	Durango.....	26,425
Veracruz.....	Veracruz.....	24,085
Toluca.....	México.....	23,150
Acanceh.....	Yucatán.....	22,916
Celaya.....	Guanajuato.....	21,245
Zapotlanejo.....	Jalisco.....	20,270
Tula.....	Tamaulipas.....	19,421
Colima.....	Colima.....	18,977
Irapuato.....	Guanajuato.....	18,593
Tekax.....	Yucatán.....	18,346
Chihuahua.....	Chihuahua.....	18,279
Xalapa.....	Veracruz.....	18,168
Motul.....	Yucatán.....	17,995
Matamoros.....	Tamaulipas.....	17,564
Ciudad Guzmán.....	Jalisco.....	17,374
Temax.....	Yucatán.....	16,807
Campeche.....	Campeche.....	16,647
Mazatlán.....	Sinaloa.....	15,852
Silao.....	Guanajuato.....	15,437
Tacubaya.....	Federal District.....	15,259
Victoria.....	Tamaulipas.....	14,774
Lagos.....	Jalisco.....	14,716
Tepic.....	Tepic (Territory).....	14,560
Salamanca.....	Guanajuato.....	13,121
Matchuala.....	San Luis Potosí.....	13,101
Allende.....	Guanajuato.....	12,740
Valle de Santiago.....	.....do.....	12,671
Tampico.....	Tamaulipas.....	11,912
Salvatierra.....	Guanajuato.....	11,008
Tuxtla Gutiérrez.....	Chiapas.....	10,952
Juchitán.....	Oaxaca.....	10,820
Culiacán.....	Sinaloa.....	10,487
Zamora.....	Michoacán.....	10,373
Espita.....	Yucatán.....	10,179
Sombrerete.....	Zacatecas.....	10,082
Mocorito.....	Sinaloa.....	9,971
Teziutlán.....	Puebla.....	9,776
Maxcanú.....	Yucatán.....	9,613
San Juan Bautista.....	Tabasco.....	9,604
San Luis de la Paz.....	Guanajuato.....	9,601
Catorce.....	San Luis Potosí.....	9,547
Pozos.....	Guanajuato.....	9,505
Ciudad García.....	Zacatecas.....	9,420
Tehuantepec.....	Oaxaca.....	9,415
Comitán.....	Chiapas.....	9,316
Uruápan.....	Michoacán.....	9,276
Jaumave.....	Tamaulipas.....	9,220
Anganguao.....	Michoacán.....	9,115
Zumpango.....	México.....	9,090
Santa Bárbara.....	Tamaulipas.....	9,079
San Juan del Río.....	Querétaro.....	9,040
Huñucmá.....	Yucatán.....	8,920
La Piedad.....	Michoacán.....	8,876
San Andrés Tuxtla.....	Veracruz.....	8,855
Sayula.....	Jalisco.....	8,819
Tamazula.....	.....do.....	8,783
Guadalupe.....	Zacatecas.....	8,781

List of the principal cities and towns of México, with their population, etc.—Continued.

City or town.	State.	Popula- tion.
Tlatlauquitepec.....	Puebla.....	8,754
Cuernavaca.....	Morelos.....	8,747
Autlán.....	Jalisco.....	8,710
Cortazar.....	Guanajuato.....	8,633
Coatepec.....	Veracruz.....	8,623
Pichucalco.....	Chiapas.....	8,549
Tlaxiaco.....	Oaxaca.....	8,535
Hermosillo.....	Sonora.....	8,474
Tapachula.....	Chiapas.....	8,472
Sahuayo.....	Michoacán.....	8,443
Parras.....	Coahuila.....	8,326
La Luz.....	Guanajuato.....	8,318
Tulancingo.....	Hidalgo.....	8,303
Chilapa.....	Guerrero.....	8,256
Pinos.....	Zacatecas.....	8,183
Córdoba.....	Veracruz.....	7,974
Tenejapa.....	Chiapas.....	7,936
Puruándiro.....	Michoacán.....	7,782
Atlixco.....	Puebla.....	7,698
Teocaltiche.....	Jalisco.....	7,568
Pénjamo.....	Guanajuato.....	7,558
Santa Cruz.....	do.....	7,440
Villagrán.....	Tamaulipas.....	7,400
Tehuacán.....	Puebla.....	7,275
Parral.....	Chihuahua.....	7,269
Linares.....	Nuevo Leon.....	7,220
Ameca.....	Jalisco.....	7,212
Matamoros.....	Puebla.....	7,184
Lerma.....	México.....	7,167
Mier.....	Tamaulipas.....	7,114
San Juan del Mezquital.....	Zacatecas.....	7,113
San Francisco del Rincón.....	Guanajuato.....	7,111
Cocula.....	Jalisco.....	7,090
Pátzcuaro.....	Michoacán.....	7,082
Ixmiquilpan.....	Hidalgo.....	7,079
Zautla.....	Puebla.....	7,053
Cholula.....	do.....	7,031
Laredo.....	Tamaulipas.....	7,022
Acámbaro.....	Guanajuato.....	6,958
Tixkokob.....	Yucatán.....	6,934
Ciudad Juárez.....	Chihuahua.....	6,917
Chalchicomula.....	Puebla.....	6,913
San Carlos.....	Tamaulipas.....	6,871
Guanacevi.....	Durango.....	6,859
Camargo.....	Tamaulipas.....	6,815
Fresnillo.....	Zacatecas.....	6,757
Yautepec.....	Morelos.....	6,756
Etzatlán.....	Jalisco.....	6,753
Peto.....	Yucatán.....	6,739
San Antonio.....	Chiapas.....	6,715
Ixtamaxtitlán.....	Puebla.....	6,699
Iguala.....	Guerrero.....	6,631
Río Verde.....	San Luis Potosí.....	6,628
Santa María del Río.....	do.....	6,589
Tixtla.....	Guerrero.....	6,588
Guaymas.....	Sonora.....	6,569
San José de Malacatepec.....	México.....	6,551
La Barca.....	Jalisco.....	6,465
Cuitalape.....	Chiapas.....	6,455
Zacualco.....	Jalisco.....	6,338
Cedral.....	San Luis Potosí.....	6,333
Landa.....	Querétaro.....	6,324
Chilpancingo.....	Guerrero.....	6,312
Huatusco.....	Veracruz.....	6,299
La Concordia.....	Chiapas.....	6,291
Zacatlán.....	Puebla.....	6,226
Zitácuaro.....	Michoacán.....	6,207
Alamos.....	Sonora.....	6,197
Reynosa.....	Tamaulipas.....	6,137
Ciudad Gonzáles.....	Guanajuato.....	6,097
Tepatitlan.....	Jalisco.....	5,994
San Carlos.....	Chiapas.....	5,977
Dolores Hidalgo.....	Guanajuato.....	5,949
Ahuacatlán.....	Querétaro.....	5,929
Huautla (San Juan Evangelista).....	Oaxaca.....	5,924
Progreso.....	Yucatán.....	5,911
Acatlán.....	Puebla.....	5,883
Santiago Tuxtla.....	Veracruz.....	5,865
Tlápan.....	Federal District.....	5,846
Zachila.....	Oaxaca.....	5,814
Yuriria.....	Guanajuato.....	5,789
Acapulco.....	Guerrero.....	5,780

List of the principal cities and towns of México, with their population, etc.—Continued.

City or town.	State.	Population.
Tlacotalpan	Vereacruz	5,770
Cármén	Campeche	5,767
Venado	San Luis Potosí	5,750
San Juan de los Llanos	Puebla	5,742
Soledad Díez Gutiérrez	San Luis Potosí	5,730
Moroleón	Guanajuato	5,716
Tizapán el Alto	Jalisco	5,708
Túxpan	Veracruz	5,697
Ocoingo	Chiapas	5,667
Guerrero	Tamaulipas	5,664
Encarnación	Jalisco	5,656
Actopan	Hidalgo	5,635
Colotlán	Jalisco	5,590
Ojitlán	Oaxaca	5,583
Atotonilco el Alto	Jalisco	5,551
Morelos (Chautla)	Morelos	5,538
Tenango del Valle	México	5,465
San Fernando	Tamaulipas	5,383
Jiménez	Chihuahua	5,381
Tlacolula	Oaxaca	5,377
Tacámbaro	Michoacán	5,369
Arandas	Jalisco	5,367
Guadalupe Hidalgo	Federal District	5,318
Ahualulco	Jalisco	5,302
Bustamante	Tamaulipas	5,260
Comonfort	Guanajuato	5,260
Ejutla	Oaxaca	5,254
La Cañada	Querétaro	5,232
Lampazos	Nuevo León	5,197
Metepec	México	5,189
Cuetzalán	Puebla	5,176
Jálpan	Querétaro	5,131
Río Grande	Zacatecas	5,008
Chiautémpan	Tlaxcala	5,006

CHAPTER VII.

AGRICULTURE.

México has been estimated to contain 479 square leagues of thick forests, 18,134 square leagues of wooded land, and 40,822 square leagues of uncultivated land.

Frederick A. Ober, in one of his works, draws attention to the fact that its shape on the map is that of a cornucopia, and calls the Aztec land a "horn of plenty"—a most appropriate simile. Nature has certainly showered her gifts upon the Republic with lavish hand. Her mines are practically inexhaustible, her forests rich in every variety of precious woods, her soil blessed with wonderful fecundity.

Yet with all these natural conditions in their favor the Mexicans for more than two centuries delved into the bowels of the earth in search of silver and gold, and left the fields to lie fallow and the forests untouched, save where their products were needed for purely domestic purposes. The far-seeing Spanish Bishop Zumárraga recognized this when he addressed to the Council of the Indies the words following:

"This country is very rich, very fertile, and thickly populated. It contains gold, silver, copper, tin, precious stones, pearls, dyestuffs, and lands abundantly producing whatever is needed. Nevertheless the Indians are the poorest people in the world, for they have neither wool, hemp, nor flax; nor have they beasts of burden. Wherefore, as bishop of México, I feel bound to beg the gentlemen of the council to make an earnest effort looking to their enjoyment of these benefits. *He who would reap must first sow;* but if, on the contrary, the tilling of the soil is neglected, to engage solely in the working of mines, the ruin of the country is certain."

It has been stated that had the money which has been spent in mining in the country been invested in agriculture, México would have been at least four times as rich as it is to-day. It has to go to the United States for its corn, hogs, and other necessities of life. The vegetable products of the country are varied in the extreme, owing to the diversified climate. Its productiveness is perhaps unsurpassed by any other country on the globe. The soil produces all the cereals and all the fruits of the United States and Europe, besides those properly incident to the Tropics.

México, enjoying as it does a peculiar geographical situation and orography, may be divided into three agricultural zones or regions,

which may be designated, according to their principal productions, as follows:

- (1) The sugar cane and rubber region in the lowlands.
- (2) The coffee region in the temperate lands.
- (3) The region producing the European cereals in the central tablelands.

The most fertile region, that which is almost spontaneously productive, is unquestionably the first, although it is the one which entails the most suffering, owing to the climate and the insects.

In this favored locality the soil is marvelously rich. In official reports to the Department of Promotion appear statements which to those unacquainted with that portion of our continent would seem incredible. An agent of that Department, reporting upon the lands in the southern part of the State of Oaxaca, states that on a sugar plantation in the district of Pochutla there have been found stalks of sugar cane 30 feet in height; that the tobacco plant, which grows wild there, has leaves 25 to 30 inches in length; that along the Toltepec River basin, in the same district, the coffee trees reach the height of large trees and produce 12 pounds to the tree. Certain wild rubber trees yield yearly 10 pounds of the dry substance. The vanilla plant grows wild also, and is excellent in quality. Three crops of corn can be taken from the same field in one year. Beans are so abundant that they are often sold in the neighborhood at the rate of 25 cents per 100 pounds. There are 18 species of bananas and many kinds of palms, one of them yielding a much-sought palm oil. One party imbued with great patience counted 5,000 limes on one wild lime tree.

Along the river bottoms of this well-watered region are millions of acres of land having a layer of humic soil 13 to 16 feet deep.

In this fertile belt are the States of Oaxaca, Chiapas, Tabasco, Campeche, Veracruz, and Guerrero, the principal agricultural products of which are cacao, coffee, sugar cane, corn, beans, and rice, which are abundant, and tobacco, rubber, pepper, and achiote, cultivated on a smaller scale. Rubber, vanilla, pepper, and achiote grow wild also. The yucca plant, from which starch is made, is found here in great quantities.

Forests of precious woods are encountered throughout this region. The State of Tabasco exported in 1890 cabinet woods to the extent of 6,511 tons, and dyewoods and plants to the limit of 7,537,400 pounds. Of late years this exportation has considerably increased. One of the important articles raised in Chiapas is indigo.

The temperate belt, although affording greater personal comforts in the way of climate and health-giving elements, is poorly watered, and the lands are not so fertile as in the hot region.

The cold zone is less fertile still, due to the absence of streams and the scarcity of rains.

The latest available report of the Department of Promotion of México, embracing a period of four years, from 1892 to 1896,¹ says, in the chapter devoted to agriculture, that the high lands in the Central Plateau can produce all known varieties of wheat, maize, beans, and tubercles, as well as the agave (maguey) and grapes, and are also adapted to stock raising and the exploitation of forest woods. Rice, sugar cane, tropical fruits, cacao, rubber, and cabinet woods can be produced in the hot region, while in the temperate zone (between 500 and 1,000 meters altitude) coffee grows abundantly, and all the fruits of the earth can be cultivated. The report continues:

“Speaking with regard to special districts, it may be affirmed that Oaxaca and Chiapas have no rival (Brazil, even, being included) in the production of excellent grades of coffee in unlimited quantities; Veracruz and Tabasco, on the Gulf side, and the Territory of Tepic, on the Pacific, are actually capable of replacing Cuba in the quality of its tobacco and the bulk of the product; Michoacán in one section, and Chihuahua, Sonora, Coahuila, and Tamaulipas in another, could supply food for millions of cattle, and Durango, Jalisco, Guanajuato, Puebla, and the State of México are capable of raising corn and wheat in almost unlimited areas, and of supplying foreign markets with a large portion of their articles of consumption from cold and temperate zones, and also with some products of the Tropics. Should we add to these the specialties of certain regions, such as Yucatán for henequén or hemp, Tlaxcala and Puebla for maguey (agave), Tamaulipas for ixtle, Coahuila for vines, and Soconusco for cacao, an approximate idea may be obtained of the incalculable importance of México as an agricultural country. Notwithstanding this, it may be said that national agriculture, even in the face of its recent progress, is yet in its infancy and that the soil has only been cultivated on a very limited scale. Neither the proportion between the area now under cultivation and the arable land, the methods, machinery, and implements now employed in the fields, nor the methods now in use for the exploitation and preparation of certain agricultural products are, in general terms, satisfactory. Our export trade is almost nihil, save for products as valuable as coffee and fruits, or as cheaply produced as henequén, or as near the centers of consumption as cattle; and even those mentioned as exported in the largest quantities, are not as extensively cultivated as is desirable, nor as cheaply as the country would permit.”

There are two main causes of this state of affairs—lack of laborers and of means of communication, both restricting consumption to an extent which necessarily limits the variety of production and giving preference to ordinary products over those which are finer and more valuable. The mountainous and broken formation of the country has

¹Memoria de la Secretaría de Fomento, 1892-1896. México, 1897, page 101, Section V.

always been, and is at the present time to a certain extent an obstacle to rapid and economic transportation of merchandise, as it hinders the establishment of permanent currents of traffic, either by land or water, and deprives the agriculturist of the advantages of natural irrigation in certain regions, which are for this reason arid and impassable deserts.

The report quoted states that another factor in the slow development of agriculture in the country has been the ignorance of the farming population in the matter of the preparation of the soil and the use of fertilizers and other improved methods of cultivation.

The Government of México has shown a decided interest in improving these conditions, and for several years the Department of Promotion has been endeavoring to disseminate among the agricultural classes information tending to educate them, teaching them improved and scientific methods of cultivation, irrigation, fertilization, and drainage of the soil, and calling their attention to those products which could be advantageously cultivated in the different zones of the Republic. With this object in view, the Department issues a monthly bulletin of agriculture, mining, and industries, and publishes from time to time important works on special subjects, which are extensively circulated among the agriculturists. The results accomplished by these publications have been most favorable to the agricultural interests of the country, so far having occasioned the establishment and development of the culture of the grape and other fruits and of forage plants, and also the introduction of apiculture and sericulture. In order to further the agricultural interests of the Republic, the Department has imported, for gratuitous distribution among the most advanced agriculturists, seeds and plants, and has also encouraged agricultural fairs and expositions. The distribution began with vine shoots and olive-tree slips and other plants, the cultivation of which is giving excellent results. The cultivation of the grape has received especial impetus in the States of Coahuila, Chihuahua, and Guanajuato.

At the beginning of 1892 there were imported 1,030,000 shoots of the vine (simple) and 11,000 with roots, which were distributed among the States of Coahuila, Chihuahua, and other points on the Central Plateau and the south of the Republic. This was attended with excellent results, and toward the end of the fiscal year 1893 shoots to the number of 3,500,000 were imported, principally from Lower California, together with 72,000 olive slips and 16,000 other fruit-bearing trees. The distribution has continued, the shoots and slips of trees already acclimated being also used for the purpose.

In certain localities the cork tree (*Quercus suber*) has been introduced, as well as the "Choro-gi" (*Hachys tubifera*), an excellent tuber of the potato family indigenous to Germany. Seeds of the fodder plant called *Zacatón de Guinea* have also been imported and distributed.

This plant requires but little care and irrigation, and its cultivation on Mexican soil has been very successful. Seeds of the "Riga" flax have been imported and distributed with a view to encouraging the cultivation of the plant and the establishment of the industries derived from its exploitation.

For the purpose of establishing the silkworm industry in the country, seeds of the best varieties of the mulberry tree for gratuitous distribution were imported from Italy, the results so far obtained being satisfactory. Chinese and Japanese cocoons were ordered from San Francisco, Cal., but the latter varieties were not obtainable, as the Japanese Government has prohibited their exportation. Cocoons of a good quality have been imported from France and distributed gratis. The results obtained in this branch of industry were shown at the Sericultural Exposition held in Irapuato in 1895, when the quantity and quality of the Mexican product attracted great attention. The silk industry may therefore now be regarded as existent in the country, its development having been noteworthy, and the product remarkable for beauty and finish. Distribution has also been made, among such agriculturists as applied for them, of seeds of kaffir, tobacco, sugar cane, agave, and flax.

The efforts of the Department to promote the agricultural interests of the country have not been confined to the importation and distribution of seeds and plants. Research and investigation have been extended to various industries, among others the cultivation of sugar cane and the manufacture of its products; also, apiculture and the cultivation of coffee, cotton, sesamum or benne seed, leguminous plants, and tubers have received attention. Frequent studies have been made of the diseases and plagues affecting certain plants, and the results have been published and extensively circulated among interested parties.

The preservation of the national forests, their replanting, and methodical exploitation, have been matters of interest and investigation on the part of the Department of Promotion, as the indiscriminate felling of trees at all seasons was gradually destroying the forests; this being especially the case since the advent of railroads and the increased number of industrial establishments using timber instead of iron as constructive material, and wood instead of coal as fuel, the latter combustible not being obtainable at a fair price in sufficient quantities. A law has been enacted on this subject, the regulations stating in detail the duties of the officers appointed by the Government to the care of the forests; the rules and principles to which the exploitation of the forests and their products are subjected; the rules to be followed in making contracts and in cutting down the trees, and also creating a reservation of national lands for forestry, allotting 2,311,445 hectares to the State of Chihuahua and 203,635 to the State of Chiapas.

With the same object of fostering the agricultural interests of the

country, several agricultural expositions have been very successfully held and prizes have been awarded to the best exhibitors, and fairs for the exhibition of cattle, implements, machinery, agricultural products in general, flowers, fishes, fruits, etc., have contributed to the same ends. During these fairs the plan of giving lectures on several topics was adopted, viz, on the usefulness of stock raising; the cross-breeding and acclimatization of cattle; the usefulness and value of agricultural machinery; on sericulture, horticulture, and other important subjects.

One of the most important problems to be solved affecting the rapid development of agriculture in México is the lack of proper irrigation, which can only be compared in magnitude to the scarcity of labor. Mexican territory, owing to its topography, has no natural irrigation. The land rises abruptly from the coast to a habitable altitude of over 3,000 meters, thus creating a serious and insurmountable obstacle both to the retention and gradual absorption of the rain waters which are precipitated over the rough surface of the land, passing with great rapidity over the fields and river beds in their course to the sea, leaving behind a deplorable and ruinous drought, and in some places an almost perpetual aridity. An extended rainy season is of especial necessity to the profitable cultivation of the soil in all the central table-land, the cold region, and in a large portion of the temperate region, but when the rainfall is scanty, as is the case in extensive sections of the northern frontier and in other regions, viz, the States of San Luis Potosí and Zacatecas, or when there is any alteration in its period, the crops are lost, the cattle suffer and the consequences are felt in all other industries. Under these circumstances, the Mexican Government realized that a matter of such vital importance could not be left entirely to private initiative, and therefore framed a law bearing date of June 5, 1888, authorizing the Executive to grant concessions, either to private parties or to companies, for the use of the waters of the Republic for irrigation purposes or as motive power in industries.

The privileges granted by these concessions are:

(1) Exemption for five years from all Federal taxes, the stamp tax excepted, on all moneys invested in the survey, construction, and repairs of the works mentioned in the concession.

(2) The introduction, free of import duties, for the first time only, of the machinery, scientific instruments, and necessary apparatus for the survey, construction, and exploitation of said works.

(3) The right to occupy gratuitously the public and national lands for the passage of canals and for the construction of dams or dikes and reservoirs.

(4) The right to expropriate for public utility any lands belonging to private parties, indemnification being previously made on the same basis as that governing railroad concessions.

The concessionaires are under the following obligations:

- (1) To make a deposit or surety in bonds of the public debt.
- (2) To submit for the approval of the Department of Promotion the plans, outlines, and reports describing the work.
- (3) To respect the rights of third parties, submitting any differences to the action of the courts, and to admit and defray the expenses of any inspecting engineer appointed by the Executive.

The law also authorizes the Executive to grant free entry into the country of the machinery and apparatus necessary to the employ of the waters, either for agricultural or industrial purposes, if the concession has been granted by a State, provided the companies give security for the performance of the work in accordance with the rules and limitations established by the Federal Executive. On the 18th of September, 1896, this law was regulated by another, which has given excellent results, many of the old concessionaires having taken advantage of its provisions. These laws have been framed not only to provide for the irrigation of the lands, but also for the use of the water as motive power, thus opening a new and extended future to the industrial progress of the Republic.

At the time of the conquest, according to the historian Bancroft,¹ the only European cereal raised in México to any extent was wheat, and although the climatic conditions were propitious, the lack of moisture, which could only be overcome by irrigation, would frequently hinder its cultivation. Notwithstanding this drawback, the yield exceeded the average returns obtained in Europe, being, in some instances, as high as seventy or eighty fold. One of the varieties, which was cultivated chiefly in the neighborhood of Puebla, and called *trigo blanquillo*, was remarkable for its abundant yield. In 1677 its cultivation was forbidden by a decree of the Viceroy and "Audiencia" as injurious to health, but it was resumed in 1692.

The transportation facilities offered by the great American railroad systems has given great impetus to the raising of this grain, and México is becoming a wheat-growing country. Wheat grows on the plateau of México at an elevation of from 6,000 to 9,000 feet above sea level and between the eighteenth and twenty-fourth parallels of latitude. The area best adapted to its cultivation comprises some 52,000 square miles, over one-third of which could be planted in wheat without serious detriment to the other agricultural interests of the country. This land is situated in the States of Michoacán, Jalisco, Guanajuato, Aguascalientes, San Luis Potosí, and Querétaro.

The Mexican plan of cultivation makes it possible to take off the land three crops every two years—one crop of wheat and two crops of corn. The average yield of wheat per acre is about 20 bushels and of corn about 50 bushels on irrigated soils and about 30 to 35 on dry

¹ History of Mexico, Vol. III, Chap. XXIX, p. 611, 1883.

lands. These are considered conservative figures. Were this wheat area cultivated to its fullest capacity, the wheat and corn yield of one-third of the 52,000 square miles of suitable lands would be: Wheat, 110,000,000 bushels, and corn, 440,000,000 bushels per year, according to a conservative estimate made in 1883. This immense yield would all be available for foreign markets, as the home consumption could be always provided for by the outlying lands. Since the date of this estimate improved machinery and more systematic treatment of the soil have considerably increased the yield of the lands devoted to the cultivation of the cereals mentioned, which are by no means all that could be utilized in this way.

Indian corn is the most abundant cereal, growing almost everywhere in the country, in some places three crops a year being raised, as stated above. It is eminently a Mexican staple, serving as nutriment for man and beast, and forming the "staff of life" for the majority of the inhabitants in the form of cakes, called *tortillas*.

The following tables, taken from a statistical work published by the Mexican Government,¹ gives the yield in kilograms and hectoliters² of four of the cereal products in all the States, and the value of the same, expressed in Mexican silver, in the year 1897:

States.	Rice.		Barley.	
	Kilograms.	Value.	Hectoliters.	Value.
Aguascalientes.....			1,105	\$1,294
Baja California.....			2,050	10,270
Campeche.....			53,647	161,131
Chiapas.....	311,256	\$45,495	2,220	4,086
Chihuahua.....			32,987	57,728
Coahuila.....				
Colima.....	6,076,700	608,210	93,633	182,108
Federal District.....			6,170	19,310
Durango.....			107,287	194,390
Guanajuato.....				
Guerrero.....	238,027	24,643	898,836	1,222,114
Hidalgo.....	31,300	5,248	43,185	67,170
Jalisco.....	352,114	33,471	589,859	1,070,834
México.....	1,867	298	60,421	96,548
Michoacán.....	4,352,550	362,702	1,671	8,937
Morelos.....	3,730,076	381,592	15,884	34,992
Nuevo León.....			42,575	97,072
Oaxaca.....	70,631	12,911	790,122	1,620,721
Puebla.....	680,922	119,557	16,162	30,255
Querétaro.....			17,885	28,112
San Luis Potosí.....	40,840	6,012	1,124	3,572
Sinaloa.....			20,751	79,989
Sonora.....				
Tabasco.....	720,130	88,484	1,000	2,000
Tamaulipas.....	176,816	32,595	1,532	1,896
Tepeic.....	3,132,083	302,737	268,815	412,699
Tlaxcala.....			7,626	15,636
Veracruz.....	1,292,690	230,507		
Yucatán.....			39,932	80,379
Zacatecas.....				
Total.....	21,136,002	2,254,462	3,116,479	2,503,243

¹ Anuario Estadístico de la Republica Mexicana, 1897. México, 1898.

² A kilogram is equal to 2.2046 pounds; a hectoliter is equal to 2.8379 bushels.

States.	Corn.		Wheat.	
	Hectoliters.	Value.	Kilograms.	Value.
Aguascalientes.....	171, 243	\$307, 940	1, 168, 845	\$63, 548
Baja California.....	8, 648	37, 385	2, 838, 947	171, 556
Campeche.....	136, 900	208, 500	.....	.....
Chiapas.....	945, 268	2, 648, 712	786, 056	94, 060
Chihuahua.....	243, 891	580, 661	4, 345, 649	517, 148
Coahuila.....	1, 072, 290	1, 133, 251	17, 260, 855	979, 849
Colima.....	203, 205	308, 181	195, 261	11, 597
Federal District.....	663, 082	1, 450, 002	9, 663, 681	602, 320
Durango.....	917, 146	2, 089, 700	55, 360, 762	5, 189, 945
Guajuato.....	4, 042, 010	7, 028, 905	.....	.....
Guerrero.....	925, 743	1, 527, 008	4, 937, 316	312, 028
Hidalgo.....	3, 764, 455	10, 981, 972	29, 695, 974	2, 409, 425
Jalisco.....	5, 844, 947	9, 494, 293	29, 984, 886	1, 980, 612
México.....	1, 580, 368	4, 383, 629	35, 745, 573	1, 740, 793
Michoacán.....	2, 756, 881	4, 766, 072	50, 271	3, 071
Morelos.....	272, 485	609, 197	3, 078, 763	143, 542
Nuevo León.....	676, 169	1, 521, 416	3, 341, 341	220, 004
Oaxaca.....	1, 383, 194	1, 619, 556	22, 252, 455	1, 414, 404
Puebla.....	1, 898, 311	5, 595, 317	11, 320, 746	858, 736
Querétaro.....	688, 467	1, 577, 990	706, 702	43, 759
San Luis Potosí.....	1, 735, 504	3, 341, 212	124, 291	7, 635
Sinaloa.....	2, 251, 697	6, 142, 898	19, 544, 145	950, 357
Sonora.....	222, 939	632, 598	.....	.....
Tabasco.....	967, 583	592, 407	.....	.....
Tamaulipas.....	707, 373	911, 534	10, 960	1, 120
Tapic.....	445, 524	647, 224	7, 262, 218	726, 220
Tlaxcala.....	334, 869	1, 143, 928	322, 000	28, 175
Veracruz.....	3, 952, 300	4, 387, 592	.....	.....
Yucatán.....	2, 873, 488	5, 743, 255	.....	.....
Zacatecas.....	1, 268, 704	2, 822, 336	3, 989, 350	210, 571
Total.....	42, 954, 684	87, 232, 671	263, 987, 047	18, 680, 475

The high price of corn in México is due to the fact that, as a rule, the Indian raises only enough to supply his wants, and does not enter the market as a seller. In June, 1897, corn in the City of México was worth \$1.50 per bushel, and had been quoted at that price for three years previous. In parts of the State of Veracruz the price ranged from \$1 to \$1.35 per bushel.

Over a million dollars' worth of corn was sent to México from the United States in the year 1896. In the fiscal year ending June 30, 1899, the corn shipments to México from the same country were 154,644 bushels, valued at \$63,412.

Mexican wheat is small and hard, and when properly milled makes good flour. Specimens of this wheat exhibited at the Centennial Exposition of Philadelphia in 1876 took the first prize.

Mexican coffee is of excellent quality; that produced in Uruápan (Michoacán) and in the State of Colima has been classed with Mocha. It is claimed that it is possible to so increase the raising of coffee that México can supply more of the aromatic bean to the markets of the world than all other countries combined, save only Brazil. The immense area adapted to its cultivation may be estimated when it is known that it grows both in the hot and temperate belts. Heretofore México occupied the fourth place among the countries importing coffee into the United States, which is her best market. Now, it is asserted, she immediately follows Brazil, which stands first. Within the last ten years this Mexican product has risen from the fifth to the third place in point of quality.

Coffee is not indigenous to the country, but it was originally brought from the West Indies about 1790. Still, it was not until 1818 that the plant was properly cultivated, when Don Juan A. Gómez, called the Benefactor of Córdoba, demonstrated that México had the soil and climate essential to the cultivation of coffee. The berry is mostly raised in Colima, Oaxaca, Chiapas, Guerrero, Jalisco, México, Michoacán, Morelos, San Luis Potosí, Tabasco, and Veracruz.¹

¹ "The coffee plant, mostly cultivated in México, is a subvariety of the Mocha, or *Coffea arabica*. This is an evergreen, partaking more of the nature of a shrub, which in a state of cultivation varies in height from 5 to 7 feet. The range of this species is at elevations of from 1,000 to 5,000 feet above sea level, south of latitude 22° north, where the temperature does not fall below 55° F.; still, the most favorable climate for it would be where the temperature does not fall below 60° nor rise above 80° in the shade; as to humidity, there should be from 75 to 150 inches of rain during the year, and the plant should be irrigated during the dry season, if required. The myrtle kind, which is considered as second in quality, is also extensively cultivated. It is very similar to the Java, and is distinguished from the Mocha variety by the leaf being larger and the corolla smaller. This plant is hardier than the Mocha kind and will stand higher temperature; it is mostly cultivated in the Córdoba district. It will thrive well at an elevation of from 500 to 3,000 feet above sea level. It is the opinion of the writer that Liberian coffee would thrive in the hot climates of Yucatán, Campeche, Tabasco, and Veracruz. This is the hardiest of all the coffee trees adapted to the climates of México, and will stand a very high temperature.

"As the coffee tree has a long taproot, it will thrive better on land where the soil is deep. The best soil in México is a well-drained, loamy one, either of a virgin mountainous composition, or of a volcanic nature, rich in humus. A rocky soil, where the earth is deep between the rocks, is very suitable, and less manuring is then required for the plants, as the rocks are continually adding to the soil by the decomposing action of the air, rain, and other natural forces. The climate most adaptable to coffee in México is that found in the mountainous regions, with a range of temperature from 55° to 86° F. The best coffee is grown at elevations varying from 2,200 to 4,500 feet above the sea, in sections south of Veracruz; but in locations below latitude 21° north, the north limit of the coffee zone on the Gulf side, the climate being cooler, the bush requires lower elevations, ranging from 600 to 3,000 feet. The plant is, however, cultivated by some planters at much lower levels, and even within a few miles from the seashore. For instance, in Misantla, Acayucán, Minatitlán, and Tuxtla, Veracruz; and in Cárdenas, Comalcalco, Cunduacán, Nacayuca, and San Juan Bautista, Tabasco. An extremely wet climate is not favorable to the coffee plant, and it will not thrive in very exposed situations. If proper aspect as regards sun and winds can not be obtained, the exposure can nearly always be modified by shelter belts of trees. On the Pacific side the prevailing south winds must be avoided at low elevations, and on this side the tree can be planted at much higher elevations, as the range which branches off at Jalisco and joins the Toluca Mountain and the Popocatepetl Peak breaks off the cold north winds and shelters the regions below it. As to direct sun exposure, when it is desirable to take advantage of the heat at high elevations, it is always convenient to acquire, as far as possible, a southern exposure; but where the elevation is low and the temperature is high, such an exposure would be injurious to the plant, in which case it is better to procure an eastern exposure. Generally, the action of the rains modifies the temperature in the Tropics, and at elevations between 2,000 and 4,500 feet above sea level clouds gather along the mountains almost every day before the rays of the noon sun bear their strong influence in those localities. On the Gulf side, the trees that have an

Mr. Matias Romero, who for many years devoted his attention to coffee culture, estimated the results of coffee raising as follows:

	Cost of planting a tree.	Annual product of a tree.	Expense of cultivating one tree.	Net profit.
		<i>Pounds.</i>		<i>Per cent.</i>
In India	\$0.20½	.4563	\$0.04	25.49
In Ceylon.....	.23	.4563	.03½	25.15
In México .....	.12	1	.05	90

Romero's averages have been considered too high as regards the cost of cultivation and too low as regards the annual yield. In an official publication¹ appears the statement that in the State of Chiapas, where the land is good, and care and economy have been exercised in the cultivation, the following have been the results:

Annual expense of cultivation (one tree)	\$0.01
Annual yield for each tree	pounds.. 10

In the State of Oaxaca on one plantation 21 months after planting, the trees yielded 3 pounds of dry coffee each.

In the District of Choápam, of the same State, the average crop is 6 pounds of coffee for each tree, and there are trees producing 25 pounds of dry coffee a year. Romero takes 1 pound as the average yield of Mexican coffee trees. In arriving at this figure he takes into consideration all kinds of coffee plantations, those laid out in poor localities, in poor seasons, and improperly cultivated; but it appears to be pretty well settled that good lands, cultivated under proper conditions, will render crops of from 4 to 10 pounds per tree. Col. E. C. More, late United States consul-general to México, agrees with Romero in that, under present conditions, the profits of coffee raising are 90 per cent per annum; but that they differ largely in the several belts devoted to the culture of the bean is evidenced by the fact that an American coffee expert of Fortín and Córdoba, State of Veracruz, states that the profits reach 150 per cent. The bean sells, according to class, at from \$24 to \$32 per hundredweight, Mexican money. In the Huasteca Potosina section of Veracruz coffee planting during the past three years has increased at the rate of 60 per cent a year. Generally it costs \$7, silver, to raise, pick, clean, and sack a hundredweight of coffee. The selling price averages \$27 per hundredweight on the ground. The product per acre is from 250 to 500 pounds. The value of the exports to all countries in 1897 was \$10,649,119.

The first recorded exportation of coffee from México to the United States was in 1825, amounting in value to \$216,850. The same coun-

eastern sun exposure, so that the sun strikes them during the morning, thrive better and yield more."—(Production of coffee in México, U. S. Consular Reports, Vol. LII, Sept., 1896, pp. 103-121.)

¹Los Estados Unidos Mexicanos, R. de Zayas Enriquez, México, 1893, p. 458.

try furnished the latter, during the fiscal year ending June 30, 1898, 34,721,168 pounds of coffee. The total yield during the year 1897 was estimated at 48,145,492 pounds.

Americans are taking up large tracts of land to be planted in coffee trees. The American Coffee Trading and Planting Company, of New York, has 60,000 trees already set out and has 1,500,000 more in a nursery on the Coatzacoalcos River. Another American company has purchased 6,175 acres in Chiapas, where they propose planting 1,000,000 coffee trees. Still another company was organized in St. Louis, Mo., in April, 1897, under the name of the Tehuantepec Coffee Culture Company, to conduct operations upon a recently purchased plantation on the Grijalva River, State of Chiapas. New York capitalists have bought a plantation near Córdoba, Veracruz, containing 480,000 coffee trees.

Official statistics published by the Department of Promotion¹ for 1897 give the following figures relative to the production of coffee in México for that year:

States.	Quantity in kilograms.	Value (Mexican silver).
Veracruz	14, 302, 714	\$4, 416, 618
Oaxaca	2, 770, 305	1, 249, 176
Chiapas	2, 465, 100	1, 427, 950
Puebla	704, 194	503, 338
San Luis Potosí	443, 625	63, 655
Michoacán	363, 401	210, 457
Tepic	263, 816	146, 285
Jalisco	166, 481	83, 350
Hidalgo	156, 046	55, 749
Total	21, 838, 659	8, 282, 028

The other States, excepting Chihuahua, Durango, Guanajuato, Nuevo Leon, Querétaro, Yucatán, and Zacatecas, not listed, produced less than 100,000 kilograms each.

The tobacco plant (the *yel*l of the Aztecs) is indigenous to México. Its cultivation and use soon became known among the Spaniards and was not seriously restricted for nearly two centuries after the conquest. In 1764 the Crown appropriated the right to the sale and manufacture of the plant, its culture being confined to the districts of Orizaba, Córdoba, Huatusco, and Zongolica, severe penalties being fixed for its cultivation elsewhere. The product was purchased by the Government at a stipulated price, which in turn sold the leaf at a profit of about 200 per cent. The revenues derived from this monopoly in 1783 amounted to \$777,651; in 1792, to \$684,109; in 1794, to \$773,442, and in 1801-02, about \$4,000,000 (silver). Under the Spanish régime factories were established in several cities, the principal being situated in México and Querétaro, each employing about 7,000 persons of both sexes, with an aggregate pay roll of more than \$700,000 a year. The

¹ Anuario Estadístico de la República Mexicana.

annual product of these establishments amounted to nearly \$7,500,000, about one-half of which belonged to the Crown.

In 1868 several foreign cultivators and manufacturers,¹ principally Cuban, went to México, where they began to cultivate the plant on an extensive scale. Not a little of the success attained in this industry is due to Frenchmen, as a French writer, Louis Lejeune, in a pamphlet on the subject, first drew attention to the fact that the tobacco grown in the upper valley of the Papaloapán River produced leaves as fine and silky and even more aromatic than those of the Vuelta Abajo, in Cuba. In his pamphlet Mr. Lejeune made an elaborate comparison of the relative cost of starting a tobacco plantation in Cuba and in México, showing that with silver at par, as was the case at the time of his writing, the expenses in México were only about one-half as great as in Cuba, not taking into account the price of land and the cost of transportation. At the Paris Exposition (1889) the Mexican product obtained gold, silver, and bronze medals, being considered equal to, if not the superior of Havana tobacco. In 1894 and 1895, "La Regie," a department created in France to regulate the importation and traffic of tobacco, began to accept the Mexican product.

In 1887-88 the exports of Mexican tobacco, both in the leaf and in a manufactured form, amounted to 764,121 kilograms, valued at \$830,363; in 1890-91 to 1,041,962 kilograms, valued at \$1,605,446, and in 1896-97 to 1,770,135 kilograms, with a valuation of \$2,720,091, Mexican silver.

The home consumption of the commodity increased in the three years from 1893 to 1896 from 12,000,000 pounds to more than 17,000,000, the Federal district alone taking 4,200,000 pounds during the latter year. Mexican tobacco goes from its home to Cuba, there to be exported as a Cuban product.

The total exports during the fiscal year 1897-98 were 7,710,183 pounds, valued at \$4,489,768, as against 3,902,440 pounds in 1896-97, valued at \$2,720,091. The total production of leaf tobacco in 1897 was 19,744,426 pounds, valued at \$2,985,920. In January, 1896, the leaf tobacco exported by México was valued at \$10.153; in January, 1897, the exports amounted to \$104,110, a gain of \$93,957.

The Mexican tobacco has a flavor peculiarly its own, and it grows upon one, and where it has been used for any length of time, as upon the Western coast of the United States, it is rapidly superseding the Cuban article.

Tobacco is raised along the mountain country lying between Victoria, State of Tamaulipas, and Campeche, capital of the State of the same name, also on the Pacific slope of the States of Chiapas, Oaxaca, Guerrero, Michoacán, Jalisco, Colima, Sonora, and the Territory of Tepic. It is likewise cultivated in the interior districts of Morelos, Michoacán, Oaxaca, Veracruz, Tamaulipas, Tabasco, Guerrero, Jalisco,

¹ Mexican Tobacco—U. S. Consular Reports, 1896, Vol. LII, pp. 612-617.

Colima, and the territory last above named. In addition to the parts named, the Government maps show 113 different cantons, or small districts, where the "weed" is now being cultivated. In the virgin valleys along the rivers of the States on the Pacific slope the plant may find the elements which best meet its requirements.

In order to produce an aromatic and mild as well as large and fine leaf it is necessary that the soil should be sandy, well charged with organic vegetable matter in decomposition, and contain oxides of iron and aluminum, and also lime, although this is not an indispensable requisite. This is the soil México provides, and it is so deep that it is not necessary to plant a crop of corn after the tobacco crop, planters instead raising a second or seedling crop of tobacco, which furnishes the small and mild leaf used in cigarette making. The extent of the tobacco region is immense, probably one hundred times that of the same region in Cuba.

As a material for "fillers" Mexican tobacco is unexcelled. Practically no wrapper tobacco is grown in México. The finest Mexican cigars go to Habana, where they sell at \$1.67 per pound. All of the Central American and some of the South American countries buy these cigars, paying an average of \$1.05 a pound.

The total production of tobacco during 1897, as shown by official statistics, was 8,956,013 kilograms, valued at \$2,985,920, silver. The same official source gives the following figures for the production by the leading States in 1897:

States.	Kilos.	Value (Mexican silver).
Oaxaca	3, 193, 518	\$1, 828, 642
Veracruz	1, 786, 066	462, 762
Jalisco	982, 979	94, 614
Tepic	725, 796	102, 612
Michoacán	556, 250	78, 778

The States of Chiapas, Sinaloa, Guanajuato, Zacatecas, Puebla, Guerrero, and Yucatán produced each over 100,000 kilos, while the remaining States produced less than that amount, with the exception of Morelos, which is not listed.

Notwithstanding the fact that México can grow the finest tobacco in the world, her imports of tobacco from the United States in 1898-99 amounted to 1,852,700 pounds, valued at \$143,786.

Cotton has been cultivated in México from time immemorial. Prior to the advent of the Aztecs in the valley of México their predecessors knew and practiced the art of cotton spinning. It is related that the second monarch of the Aztec dynasty took to wife Miahuxochitl, daughter of the lord of Cuernavaca, not alone to form a strong alliance, but also to provide raiment for his naked followers. It is recounted that the Aztec women had 200 methods of manufacturing cotton.

Although México is so thoroughly adapted by soil and climate to the production of this fiber, and although she has an acreage sufficient to produce it in quantities greater than the United States, she is not only not an exporting nation, but actually imports annually about \$2,000,000 worth of the staple to supply the demand of her factories. In 1897-98 she imported 21,216,287 pounds from the United States, and in 1898-99, 18,064,891 pounds. It has been said that with direct railroad communication from the Pacific coast to the interior the Yaqui River region in Sonora alone would supply that demand, and more.

Cotton is produced on the seaward slopes of both cordilleras, and also in the interior of the country. The great cotton belt is the Laguna district, in the State of Coahuila, which has a length of about 40 miles, is rather narrow, and follows the Nazas River, being almost entirely under cultivation. It is distant about 700 miles from the City of México, and is in railroad communication therewith. Under fair conditions the annual crop will yield \$10,000,000 in value.

The principal cotton-producing districts, other than that named above, are: On the Gulf side, the cantons of Cosamaloápam, Tuxtla, Tuxpam, Tautoyuca, and Veracruz, in the State of Veracruz. On the Pacific slope, from Sonora to Chiapas. In Sonora, the valleys of the Yaqui and the Mayo; in Sinaloa, the valley of the Fuerte; in Tepic, the valleys of Tepic and Santiago, the fertility of which is astonishing, and in Jalisco, Michoacán, Guerrero, Oaxaca, and Chiapas the production is great, and could, at a small cost, be made enormous. In the central part, Chihuahua, Coahuila, Durango, and Nuevo León are the principal producers.

The methods of cultivation employed are still rather primitive, the plow until very recently being little used, and nature being left to exercise her agencies unaided. With the intelligent use of improved machinery and a knowledge of advanced methods of cultivation México need never import an ounce of cotton. There are great advantages in the cultivation of Mexican cotton, as the plants continue to bear profitable crops without the use of fertilizers on the soil or the renewal of seed, which is necessary each year in the United States.

The staple of the Mexican cotton is longer than that of the United States, but is not so soft and lustrous.

The total production of cotton during the year 1897, according to Mexican official figures, was 32,915,394 kilograms, valued at \$12,803,679. The production by States was as follows:

States.	Kilos.	Value (Mexican silver).
Coahuila.....	17,968,187	\$6,264,632
Durango.....	5,553,043	5,403,373
Guerrero.....	4,265,000	235,900
Tepic.....	2,479,000	206,090
Veracruz.....	1,578,675	503,717

Tamaulipas, Hidalgo, Sonora, and Sinaloa, together, produced over 750,000 kilos, and the other States, excepting Aguascalientes, Campeche, Guanajuato, México, Morelos, Querétaro, Tabasco, Tlaxcala, Yucatán, and Zacatecas, not listed, produced less than 100,000 kilos.

Cacao (*Theobroma*, in Greek—the food of the gods) is another plant indigenous to México. It has been cultivated by the aborigines from remote times, and from its bean they made their drink *chocolatl* (chocolate), which was considered to have great sustaining virtues, and Cortés, speaking of the general adoption of the beverage by his soldiers, in his first letter to Charles V says: “He who has drunk his cup of chocolate travels a whole day without taking other food.”

Ever since chocolate came into general use in Europe, in the latter part of the seventeenth century, the high-grade cacao has been furnished by the States of Tabasco and Chiapas. The Mexican home consumption is very large, yet the production does not meet the demand, which is ever increasing.

The cacao requires a warm and moist atmosphere, the best lands lying between sea level and 1,600 feet above, in localities protected from strong air currents. Although there are many districts in México affording the necessary conditions of climate and soil, the cultivation of the cacao is almost entirely in the hands of the Indians, who raise it on a small scale and carry their crops to market, where they are bought by merchants, who store them away until a sufficient quantity is collected to ship to the large consuming centers. The plant begins bearing three or four years after planting, and usually gives three crops a year, although in some parts of Chiapas four crops have been garnered in a twelvemonth.

A Mexican authority thus estimates the cost of establishing and maintaining a cacao plantation for a period of eight years:

Cost of 100 acres of land.....	\$500
Clearing same for cacao, staking, planting shade trees, cacao, and corn between the rows of the cacao plants, care of corn, and expense of harvesting..	1,340
Value of corn crop.....	1,200
Second year:	
Cost of maintaining plantation and of planting, cultivating, and harvesting corn crop.....	1,130
Value of corn crop.....	1,000
Third year:	
Cost of maintaining plantation, raising last crop of corn, and gathering first crop of cacao.....	1,600
Value of corn and cacao.....	1,600
Fourth year:	
Cost of maintaining plantation.....	1,444
300 <i>cargas</i> ¹ of cacao.....	7,500
Fifth year, profits.....	6,000
Sixth year, profits.....	8,300
Seventh year, profits.....	10,490
Eighth year, profits.....	21,000

¹ The *carga* here mentioned is equivalent to about 60 pounds.

The plants reach their maximum production the ninth or tenth year, and after the twenty-third year their yield diminishes. The trees are planted about 400 to the acre, and an authority places the average yield of 1,000 trees at 600 pounds. The cacao industry has proven a considerable source of wealth to the State of Tabasco, and it is strange that investors have not recognized its profitableness.

It is asserted by good authority that land well adapted to the raising of cacao plants can be purchased for about \$8 an acre, Mexican money, in sections of from 100 to 500 acres.

As the bean of the plant is extensively used in the manufacture of chocolate, and it is utilized in the making of salves for medical use, such as cacao butter, its cultivation offers an inviting field for profitable speculation.

In the year 1897, according to Mexican official statistics, the States producing cacao in greater quantities were:

States.	Kilos.	Value (Mexican silver).
Tabasco.....	118,032	\$198,898
Chihuahua.....	144,491	32,256
Veracruz.....	10,000	16,100

Oaxaca, Michoacán, Guerrero, and Colima produced less than 10,000 kilos each.

The other States are not listed. The total production of the Republic is estimated at 590,669 kilos, with a valuation of \$565,808 in silver, in 1897.

The consumption of cacao in México is so general that in 1896-97 it was imported to the value of \$106,126, and in 1897-98 to the value of \$182,642.

The rubber tree grows wild in many parts of México; it abounds in the warm latitudes of the States of Veracruz, Tamaulipas, Tabasco, Guerrero, Oaxaca, Chiapas, Colima, Michoacán, and the Territory of Tepic. Except in isolated cases, the cultivation of the tree has not been seriously undertaken. The natives, not appreciating the value of so important an element in the arboreal vegetation of the country, have been accustomed for many years to extract the milk from the tree, boil it, and take the rubber made into balls to the market without any further preparation or treatment. The natives also chopped down and destroyed great numbers of these trees.

In the Tehuantepec region there are said to be 1,200 square miles of territory susceptible of growing the rubber tree. There it is valuable not only because of its product but also for the good results it gives in furnishing shade to coffee and cacao trees. The tree begins to yield when 6 or 7 years old, but it is not considered advisable to tap until it is 9 or 10 years of age. If the tapping is properly done

(once a year, in October and November, for instance) it will produce for twenty-five years. It produces 1 pound of gum when 10 years old and $2\frac{1}{2}$ to 3 pounds when 15 years of age.

The cost of planting and care for the first year is from $4\frac{1}{2}$ to 5 cents, and $1\frac{1}{4}$ to $1\frac{1}{2}$ cents for cultivation in the subsequent years. On the isthmus the gum sells for 40 to 60 cents, gold, per pound, on the plantations.

Romero states¹ that the milk yield of each tree six years after planting is estimated at 6 pounds, which, reduced to rubber, loses about 55 per cent, and he calculates that a plantation of 100,000 trees would produce a net profit at the end of six years, at the prices then prevailing (1871), of \$110,880.

The best climate for the culture of the rubber tree is the hottest, and the best land the dampest and the nearest to the seashore or on the low-lying banks of rivers. The tree requires but little labor for its cultivation. An economical method of growing it is to plant the trees as shade for coffee and cacao plantations, rubber itself not requiring the shade, but, on the contrary, experience in México has demonstrated that trees growing in the sun are healthier and better than when protected from its influence. The prevailing opinion among the agriculturists of México seems to be that 2 to $2\frac{1}{2}$ meters from tree to tree on every side is the proper spacing in planting rubber trees. The hardiness of the plant greatly simplifies its culture, thus rendering it proportionately cheap. In the low, hot, damp lands most favorable to its growth the fertility of the soil is so great that the necessary labor may be said to consist solely in weeding the plantations, and as the rubber plant possesses a vitality superior to that of weeds or of any other kind of vegetation, in proportion as the trees grow larger the necessity for weeding becomes less imperative. Another point in determining the success of a plantation is the method employed in tapping the trees. This operation must be performed very carefully, so as not to injure the woody structure beyond the bark, nor must the bark be separated in two portions, thus isolating the upper and lower sections of the tree and preventing the ascent of the sap. For the fiscal years 1887-88 and 1888-89 the exports of rubber were valued at \$169,385 and \$124,547, respectively. From that time to 1894 they gradually fell off, and in 1896-97 there were exported 64,843 kilograms, valued at \$63,126. The total production during the year 1897, according to official figures, amounted to 134,301 kilograms, valued at \$194,881. Tabasco was the State that produced the most rubber, being quoted, in the Mexican statistics, at 51,936 kilograms, valued at \$121,516. Next follow Chiapas with 49,614 kilograms, worth \$47,686; Veracruz, 14,300 kilograms, with a valuation of \$11,455, and Tepic 11,170 kilograms, at \$7,571. Puebla and Campeche produced together a little over 7,250 kilograms.

¹ Coffee and India Rubber Culture in Mexico. New York, 1898, p. 382.

One of the principal productions of México is the gum known as *chicle*, which exudes from the *chico-zapote* tree, found growing wild along the Coatzacoalcos, Corte, Coachapa, and Uspanapa rivers. The product of this tree is usually gathered by the Indians in the forests along these rivers, and no important attempt has been made toward growing the tree as an industry, although the gum forms a very large proportion of the exports of the country, amounting in 1896-97 to 2,122,337 kilograms, valued at \$1,529,047. The cultivation is inexpensive, being not greater than 1½ cents per tree annually, and it would seem that where one chewing-gum factory in the United States had an output in the year 1896 of 1,000,000,000 pieces of chewing gum, all made from the Mexican *chicle*, the industry would be a remunerative one. The trees should be planted not more than 400 to the acre, at a cost of 5½ cents each. They mature after reaching the age of 8 or 10 years, when they are from 12 to 15 inches in diameter and in a condition to tap. Each tree yields from 5 to 6 pounds of the merchantable gum, at a cost of 8 to 10 cents per pound to extract it, and sells for an average of 50 cents per pound at Minatitlán and Coatzacoalcos, on the Isthmus of Tehuantepec.

In 1898-99 the United States imported from México *chicle* gum to the amount of 2,445,061 pounds, valued at \$363,051 gold.

The total production of the various gums and resins for the year 1897 was as follows: Chicle gum, 753,284 kilograms, valued at \$480,775; "Mesquite" gum, 43,507 kilograms, worth \$14,388, and "copal" resin, 9,244 kilograms with a valuation of \$878.

As far back as the time of the Aztecs the vanilla bean was used to spice the chocolate. The Spaniards, quick to see the value of vanilla as an article of export, began the cultivation of the aromatic pod. For a long time the former province of Veracruz supplied the whole world with vanilla until the Bourbon Islands and Java waged competition against it.

France is the leading market for this product; Germany, England, and the United States follow in the order named. México furnishes over two-thirds of the vanilla beans imported by the United States—140,000 pounds a year, worth \$640,000.

The vanilla of México is the superior of all other varieties as to aroma, and the pod yields a much larger quantity of essential oils. In the markets of the United States it commands two or three times as high a price as that of other countries.

Usually the plant begins to yield thirty-nine months after planting. It thrives best in the damp, not muddy or swampy, lands of the torrid zone, shade being a necessity, and yields its product during 10 to 12 years. The average yield is from 10 to 20 pods to the vine, artificial fertilization of the flower producing much more. The cultivation of vanilla has many advantages, among others that corn and similar

products may be cultivated in conjunction with it, and on coffee plantations as a secondary product.

In México the pods are sold by the thousand. The cost for clearing and planting an acre of ground is estimated at \$39, and the cultivation, including the artificial pollenizing of the flower, amounts to about \$9 a year for each acre. The expense of gathering, curing, and preparing the pods for market is about \$26.50 per thousand. Of recent years green vanilla has been selling at Papautla, a canton of the State of Veracruz, where the best quality grows, at prices ranging from \$80 upward a thousand pods. In 1896 it sold for \$146 a thousand.

Vanilla grows in the States of Veracruz, Oaxaca, Chiapas, Tabasco, Michoacán, and Jalisco, also on the Isthmus of Tehuantepec, where there are two species growing in a wild state.

According to Mexican official statistics, the production of the vanilla bean during the fiscal year 1896-97 was estimated at 23,555 kilograms, valued at \$192,244, the State of Veracruz alone producing 21,855 kilograms, worth \$191,040.

The cultivation of sugar cane was among the agricultural improvements introduced into México by the Spaniards. It appears that Cortés had two plantations in Izcaltapam, and these were followed by others until in 1553 sugar was exported from México to Spain and Perú. The cultivation of the cane was then limited to the "Intendencias" of Guanajuato, Guadalajara, Puebla, México, and Veracruz. Toward the end of the eighteenth century the industry received a great impetus on account of the poor crops of Santo Domingo and other cane-producing countries. The increase in the development of the industry, however, was not so great as had been anticipated.

All the coasts of the Republic, the entire *tierra caliente* or hot lands, and a great part of the temperate region are adapted to the cultivation of sugar cane, yet this great source of wealth may be said to be just emerging from the infantile stage, when the vast domain susceptible of producing the toothsome cane is considered.

The largest plantations in the country are, strangely enough, situated in the interior, where the yield of the soil is less than on the coasts, and where the question of transportation cuts a considerable figure, wherefore the production is limited to the home consumption, while the great future of the sugar industry lies in exportation. A want of capital, and other causes, has had its effect upon the coast plantations.

The cane, especially on the Gulf slope, grows to an enormous size, and does not need regrowing for ten years at least. No ploughing or irrigating is needed. Clearing, planting, and cultivation does not cost \$45 per acre, and the cane is ready to cut in ten months after planting. The plant produces from 30 to 35 tons of cane per acre, yield-

ing 20 to 25 tons of juice, containing from 15 to 16 per cent of crystallizable sugar, and a plantation well cared for will yield for thirty years. The process now in vogue only extracts about 6 per cent of this sugar; it is asserted that by the use of improved machinery an acre could be made to yield 3 tons of refined sugar. At Suchilapam and adjacent places four canes have yielded a gallon of juice.

It is claimed¹ that in the States of Morelos, Puebla, Michoacán, Jalisco, and Colima the yield of cane to the acre may be reasonably counted upon at 45 tons, while in Veracruz, Oaxaca, and Chiapas as much as 60 tons are obtained, the general average in the northern part of Veracruz, Tamaulipas, and Nuevo Leon being 40 tons. Prices paid to the cane grower for the purchase of this cane by the factories vary from \$3.60 to \$6 Mexican currency per ton of 1,000 kilograms, or 2,240 pounds. The price of white sugar in loaves is 8 cents per pound; molasses averages \$25 a ton, and the *aguardiente*, or spirits, from \$8 to \$14 per barrel. The same authority quotes an estimate, which is claimed to be very conservative, of the results that can be obtained in a 500-acre plantation, the net product of which is estimated at \$188,425 per annum, while the approximate cost of machinery, buildings, etc., for a sugar factory to take off the crop in one hundred days, is given at from \$100,000 to \$300,000 Mexican currency.

Mexican official figures for 1897 give the following amounts relative to the production of cane and its by-products in the Republic for the year 1896-97:

Products.	Kilograms.	Value (Mexican silver).
Sugar	65,803,119	\$9,176,567
"Panocha" (brown sugar).....	61,856,435	5,031,993
Molasses	44,847,421	1,481,469
Rum.....hectoliters..	812,690	3,930,704

The total production of sugar cane was estimated at 1,261,431 tons, at \$17,516,833.

With the exception of the States of Lower California, Chihuahua, Coahuila, Durango, Guanajuato, Hidalgo, and Sonora, and the Federal District, which do not appear in the statistics at hand, all the States produced sugar, the principal being: Morelos, 38,247,812 kilograms, valued at \$4,637,590; Michoacán, 7,374,103 kilograms, \$1,230,826; Jalisco, 5,266,214 kilograms, \$903,199; Oaxaca, 3,610,239 kilograms, \$331,902; Puebla, over 2,500,000 kilograms; and Veracruz and Yucatán over 1,500,000 kilograms each. None of the other States in the list reached the latter figures.

All of the States produced brown sugar (*panocha*), Nueva Leon being listed with 15,055,078 kilograms, valued at \$1,152,280. Morelos pro-

¹ The Hacendado Mexicano's Sugar Report, 1899-1900, Mexico City, p. 3.

duced 25,106,350 kilograms of molasses, valued at \$1,113,560; Chiapas, 5,626,643 kilograms; and Oaxaca, over 5,000,000. The other States are credited with proportionate amounts, with the exception of Guajuato, Durango, and the Federal District, which are not listed.

The production of rum is estimated, as before stated, at 812,690 hectoliters, Puebla being at the head with 262,758 hectoliters, valued at \$5,185,675, followed by Chiapas with 162,299 hectoliters, with a valuation of \$3,133,382. The other States produced less than 100,000 hectoliters each, with the exception of Lower California, Chihuahua, Sonora, and the Federal District, which are not listed.

Mexico is undoubtedly the country *par excellence* for the production of fiber plants. They grow there in abundance and in a wild state. Chief among them is the *heniqué*n (*Agave rigida*), also called sisal grass or hemp, the natural home of which is the peninsula of Yucatán. It belongs to the *Maquay* (*Agave*) family and was called *metl* by the Aztecs who from time immemorial used it as an article of food, the leaves being utilized for roofing, the fiber for weaving, and the juice for the preparation of a drink called *octli*, the *pulque* of to-day.

There are several species of the plant, known by Maya names, and which require little or no cultivation and but small outlay. For several years this article has constituted the main export of Yucatán, where in 1897 there were produced 47,042,134 kilograms of the fiber, valued at \$6,932,327 Mexican silver. During the fiscal year 1897-98 there were exported through the port of Progreso, Yucatán, 75,183,816 kilograms of the raw material, destined for the United States and Europe.

The total production of this fiber in 1896-97, according to Mexican official figures, amounted to 50,226,056 kilograms, valued at \$7,394,517 silver, divided as follows:

States.	Kilograms.	Value.
Yucatán	47, 042, 134	\$6, 923, 327
Campeche	3, 083, 300	456, 222
Oaxaca	40, 000	800
Sinaloa	30, 000	4, 200
Chiapas	30, 622	968

Heniquéen occupies the second place in the exports of México. In the fiscal year 1897-98 the exports of this fiber to the United States amounted to 68,432 tons, valued at \$5,104,228 gold, and in 1898-99, 69,596 tons, with a valuation of \$8,902,213 gold. According to Mexican official figures, the total exports of the raw and manufactured article in 1896-97 were 71,085,535 kilograms, with a valuation of \$7,431,852 silver for the raw material, and 6,162 kilograms of its manufactures, valued at \$1,954 silver.

Among other fiber plants in the country the *ixtle* or *maquay manso*

(*Agave ixtle*) is found. In 1896-97, according to Mexican official statistics, the production of this plant amounted to 12,924,520 kilograms, valued at \$2,973,775, Chiapas ranking first among the States of the Republic with 6,557,043 kilograms, valued at \$2,430,338 silver. The exports for the same year are officially estimated as follows: Raw material, 9,143,009 kilograms, valued at \$807,162, and 22,468 kilograms in a manufactured state, with a valuation of \$5,812 silver. The United States imported during the fiscal year 1898-99, ixtle or Tampico fiber, as it is also called, to the amount of 4,419 tons, valued at \$274,811 gold. Paper is one of the derivative products of ixtle, for the manufacture of which it produces an excellent pulp.

There are many other fiber plants in the country, such as cotton, already mentioned; the *angú* (*Hibiscus esculentus*), which also serves as food; hemp (*Canabis indica*), both textile and medicinal; the *ceibón* or cotton-silk tree (*Bombax pentandria*); the *hunari* (*Sida rhomboides*), also medicinal; several plants of the Agave family; the *pita* or wild pineapple (*Furcraea gigantea*); the pitahaya (*Cereus variabilis*); the *ramie* (*Boehmeria hirsuta*), of which there are two varieties; and several others, such as the plantain (*Musa textilis*), the cocoanut tree (*Cocos nucifera*), and the Lechuguilla (*Agave heterocantha*).

The *maquey*, from which the national drink, *pulque*, is extracted, is indigenous to México, but it is found growing in the United States, although not in any great abundance. There are 125 species of this plant peculiar to México. The *maquey* grows most abundantly on the great plains, the plateaus, at an elevation of more than 7,000 feet above the sea. On the vast plains of Apam, about 100 miles from the capital, the plants are to be seen as far as the eye can reach, laid out in straight rows having an interval of 3 yards between them. It is said that there are 33 species of the plant on the plateaus. As far back as 1519 the native Mexicans cultivated the *maquey*, of which great variety of products were obtained from the roots, leaves, and juice. Paper was made from the pulp of the leaves; twine and thread from their fibers, and needles from the sharp tips of their leaves. These leaves also serve as thatching for the houses of the poor. The rare and valuable Mexican manuscripts in ancient times were made of pulp from the *maquey*, which resembles the papyrus. It is claimed that at least forty different articles are manufactured from the plant. Some of the *maquey* plantations produce a revenue of \$10,000 to \$12,000 per annum.

Pulque is the fermented juice of this plant, and the consumption of this beverage in the City of México and outlying towns in the Federal District is something enormous. In the city alone during the second half of the fiscal year 1897-98 there were 909 shops devoted exclusively to its sale. A train on the Mexican Railway leaves the plains of Apam every day laden with nothing but *pulque* in barrels and skins,

deriving a large revenue from the shipments. In the year 1896-97 the Mexican Inter-oceanic Railway carried 47,714 tons of *pulque*, and during the first half of 1897 the Mexican Railway carried 43,750 tons, earning \$145,635 therefor.

According to Mexican official statistics, the alcoholic products derived from *maguey* in 1897 were as follows: Pulque rum, 13,967 hectoliters, valued at \$123,787; mescal or tequila, 399,281 hectoliters, \$4,135,377; pulque, 2,639,028 hectoliters, \$4,939,673; and tlachique, 2,422,171 hectoliters, \$2,940,701. The States producing the largest quantity of pulque were: México, 1,059,338 hectoliters, valued at \$1,784,249; Hidalgo, 811,089 hectoliters, \$1,934,880; and Tlaxcala, 456,200 hectoliters, \$483,680.

Mescal or *tequila* is a strong alcoholic beverage, colorless or of a very light amber tint. It is distilled from the root of the *maguey mescal* or *tequila* (*Agave americana* Lam.), and has an odor and taste not unlike Scotch whisky. Mexicans claim that it has good stomachic qualities, but it is a great intoxicant. The best quality of the article comes from the district of Tequila in the State of Jalisco, from which it derives its name. In 1897 this State produced 167,317 hectoliters of pulque, valued at \$1,604,378, and Coahuila's output of the same article is given as 96,936 hectoliters, with a valuation of \$117,181.

Tlachique is the unfermented juice of the *maguey* and is consumed in large quantities. In 1897 the Mexican official figures for the production of this article credit the State of México with 2,068,186 hectoliters, valued at \$1,854,385, and Hidalgo with 116,946 hectoliters, worth \$168,739, silver.

The Mexican broom corn is named *Zacatón*, but it is not cultivated, even though it figures quite largely in the list of exports. It not only is not cultivated, but in some localities efforts are made to uproot it as an injurious plant, since it will not allow the growing of any other plant alongside of it.

The root is used in Europe and the United States for the manufacture of brooms, brushes, etc. The plant grows wild on the high table lands and could be cultivated at a very small expense. The selling price on the ground varies between \$6 and \$8 per hundred pounds. In the year 1896-97 there were exported 4,051,136 kilograms of the root, valued at \$1,187,700, and in 1897-98, 4,560,268 kilograms, at \$1,196,293, silver.

México produces several plants yielding oils, both industrial and esculent; but up to the present no great industry has been founded in the country based upon the presence of many varieties of trees and plants giving oil-bearing products and the adaptability of much of the soil to the cultivation of these and other species.

Among this kind of plants may be mentioned the *piñón* (*Jatropha curcas*), which yields 16 per cent of an emeto-cathartic oil of great strength.

The *Palma Christi*, or castor bean (*Ricinus communis*), yields 40 per cent of a medicinal oil. As this contains a large proportion of stearin it can be used in the manufacture of candles. This plant grows spontaneously and in great profusion in the hot and low temperate lands. One acre will produce about 1,600 pounds of oil. The *ajonjolí* (*Sesamum indicum*), or sesame, gives 33 per cent of a very soft, sweet, and agreeable oil.

The nut of the *hacaco* (*Chrysobalanus icaco*) also produces the same percentage of an esculent oil having the same properties as the almond oil.

The peanut (*Arachis hypogæa*) gives the same amount. This and the last above-named oil are much prized in Marseilles.

Among the oleaginous plants may be mentioned the following: Cacao (*Theobroma Cacao*), Cocanut (*Cocos nucifera* and *Alfonsia Elaeis oleifera*), the *Chicalote* (*Argemone mexicana* and *A. grandiflora*), the *Chia* (*Salvia polystachia*), the linseed, and others.

The Anuario Estadístico for 1897 estimates as follows the production of several oleaginous plants: Sesamun, 651,831 hectoliters, valued at \$107,086; peanut, 140,357 hectoliters, \$341,198; Chia, 38,931 hectoliters, \$4,271; castor bean or Palma Christi, 14,603 hectoliters, \$34,418. Michoacán produced 418,386 hectoliters of sesamun, and Veracruz 191,583, valued at \$33,420 and \$42,697, respectively. Guanajuato produced 25,202, and Zacatecas 24,610 hectoliters, the respective valuations being \$70,924 and \$72,525. Veracruz produced 34,000 hectoliters of Chia, worth \$3,400, and Puebla 4,830 hectoliters, valued at \$386. Of Palma Christi, Yucatán is credited with 5,105 hectoliters, at \$9,934, and Oaxaca, 3,592 hectoliters, worth \$4,117. Jalisco's linseed crop amounted to 63,638 hectoliters, worth \$254,555, and that of Puebla to 17,020 hectoliters, valued at \$1,021.

The experiment of introducing the vine, olive trees, and the silk-worm industry into México dates back as far as the conquest. Cortés himself had plantations of mulberry trees at Yantepec and Tetecla. The silk-worm industry made fair progress at first, but the competition of Manila and Spain caused its gradual neglect. In 1790 an effort was made to revive it, but without success.

"The cultivation of olives and the vine," says Bancroft¹ "labored under severe restrictions. Admirably adapted as soil and climate were for both purposes, the few plantations of olives were merely allowed to exist because they belonged to pious or charitable establishments, while as to the vine, the viceroys were repeatedly instructed not to permit the planting of new cuttings, nor even the replacing of vines in decay (1595). Wine could only be made on condition of paying taxes to the Crown, and it was not until 1796 that a more liberal policy in this respect was adopted."

¹ History of Mexico, Vol. III, p. 613.

At the beginning of this chapter reference was made to the efforts of the Department of Promotion to encourage the culture of these plants. According to the report made by Señor Don Francisco Mallén to the Department of Promotion on the encouragement given to the propagation of vines and fruit trees in the country, México, in 1892, imported 1,053,450 plants, as follows: Vine cuttings, simple, 1,030,000; with roots, 11,000; olive cuttings, 9,250, and fruit trees of different varieties, 3,200. More than half a million of these vine cuttings and 4,000 olive shoots were planted in Parras and 62,500 cuttings in Viesca, both in the State of Coahuila; 50,000 in Ciudad Juarez, Chihuahua, and the rest were distributed in the Central Plateau and other regions in the southern part of the Republic. The first trial plantations were very successful, and the culture of the fine imported qualities has become more general, the planters having requested renewals of their original orders. The grape thrives best in Parras, which has become the center of viticulture in the country. California vines have given better satisfaction in this section than those from Europe. At the time of the above-mentioned report (1892), the Rosario plantation or vineyard (the largest in the Republic) had made a request for 25,000 additional cuttings, being already supplied with 60,000 vine stocks of the European and about 13,000 of the California species, some of the former having been grown from those distributed by the Department of Promotion, while others had been imported directly from Spain, Italy, and France. It has been demonstrated that the California species thrives better.

The "Anuario Estadístico" for 1897 only mentions five plantations devoted to the cultivation of the vine, four in Coahuila and one in Guanajuato, but estimates the total production of grapes during the same year at 2,060,436 kilograms, valued at \$78,840 (silver), including 16 States and 1 Territory among the grape-producing sections of the country. First in order of importance comes Coahuila, with 1,361,301 kilograms, valued at \$14,827; followed by Chihuahua, with 291,368 kilograms, at \$17,429; Durango, 127,256 kilograms, at \$15,035, and Zacatecas, with 108,748 kilograms, at \$10,892. The same authority estimates 1,242 hectoliters, valued at \$46,285 (silver), as the total production of grape rum, and 20,952 hectoliters, worth \$257,910, as the total production of grape wine during the year 1896-97, Coahuila being credited with 900 hectoliters of the former and 6,000 hectoliters of the latter, valued at \$32,400 and \$120,000, respectively. Durango's production was estimated at 250 hectoliters of grape rum and 3,315 of grape wine, for \$9,900 and \$27,514, respectively. Lower California produced 7,516 hectoliters of wine, valued at \$30,712, and Jalisco is quoted as equaling Coahuila in the wine output.

It can not be said that México has as yet developed into a wine-making country, but serious efforts in this direction have been made

since 1883. The wines now made, as a rule, are too light and acidulous. Table grapes are raised in considerable quantity, however, and their quality is becoming a dangerous rival to the California varieties for local consumption.

The land best adapted to viticulture is in the vicinity of the city of Parras, State of Coahuila. Since 1890 the industry of the manufacture of wines has been making great strides. Several varieties of vines have been imported from abroad, and at the two largest wineries cellars have been constructed and all the latest improvements for vinous fermentation introduced, being under the management and direction of foreign experts in the art.

In 1897 there were about 4,000 acres planted in vines in the locality named, most of the grapes being of the variety known in California as the "Mission" grape, it having been introduced there by the missionary fathers from Spain. In the year noted wine sold on the ground at \$1.20 per gallon Mexican money.

As regards olive and mulberry trees, the only official data available show that in 1893 there were imported 72,000 olive cuttings, of which 4,000 were planted in Parras. It is anticipated that the encouragement given this industry by the Department of Promotion will greatly advance its progress.

When the late Gen. Carlos Pacheco was Secretary of Promotion he gave new life to the cultivation of the vine and the mulberry tree. The latter, which is so necessary to the silkworm industry, is now receiving attention in many places, principally in the States of Puebla, Jalisco, Michoacán, and Guanajuato. A Mexican planted, in 1896, 152,000 mulberry trees in the State of Guanajuato, pursuant to a contract made with the State legislature, in which contract he binds himself to lay out 2,000,000 trees within two years.

México possesses exceptional conditions for the production and trade in fruit owing to her situation and the fertility of her soil. The United States, her principal market, lies at her very doors, and communication by water and land is both rapid and moderate in charges.

The most favored Mexican fruits in the United States are the orange, lemon, lime, pineapple, and banana. But the day will come when other luscious tropical fruits will be appreciated and become a large element of the American imports. Fruits such as the mango (*Mangifera indica*), custard apple (*Anacardium occidentale*), cherimolia (*Anona cherimolia*), mamey (*Mammea americana*), zapota (*Achras zapote*), the alligator pear (*Persea gratissima*), and others which are distinctively tropical, when properly appreciated, will be consumed largely in American markets.

The banana and the orange grow spontaneously in great abundance near the Mexican coast. On lands near the sea, at an elevation of

from 1,900 to 2,400 feet above it, great plantations of banana trees can be laid out at a cost of 5 cents per plant, which includes every expense up to the time of bearing fruit. At the end of the first year the plant produces one bunch, which can be sold in the United States at from \$2.50 to \$3. A thousand banana trees, costing \$50, will bring \$1,000 at least in one year. An acre will produce from 700 to 800 bunches, at a cost not exceeding 8 cents a bunch, each of which can be sold on the ground for 40 cents, yielding a net profit of at least \$225 per acre. The exportation of this fruit from the West Indies and Central America reaches into the millions every year.

According to the Mexican official statistics the Republic produced, in 1896-97, bananas to the amount of 770,499,050 kilograms, valued at \$458,922. Oaxaca was the largest producer, being listed with 740,458,596 kilograms, valued at \$45,000, Veracruz producing over 9,000,000 kilograms, at \$68,000; San Luis Potosí, over 5,000,000 kilograms at \$9,000; Jalisco over 3,000,000 kilograms, and Michoacán and Puebla, over 2,000,000 kilograms each.

Mexico affords much better facilities for the cultivation of the aurantiaceous fruits than the southern part of Europe, which suffers the disadvantage of lack of rains in the summer, rendering it necessary to irrigate the trees for five months in the year, thereby incurring an increased expense. In México the rains begin in May or June, thus rendering irrigation wholly unnecessary.

The orange is the leading member of the aurantiaceous family under the genus citrus. Three kinds grow in México—the sweet, the sour, and the Chinese or mandarin, and another variety called “lima-orange,” which is a variety of the sweet orange.

Mexican official statistics for 1897 give the following figures for the production of oranges in 1896-97:

State.	Kilograms.	Value (Mexican silver).
Oaxaca.....	730,585,000	\$647,000
México.....	103,608,730	2,701,763
San Luis Potosí	9,000,000	Not given.
Veracruz.....	8,000,000	Not given.
Jalisco.....	4,000,000	Not given.

The California and Florida stock have recently been imported into the country and grafted and budded with the Mexican trees. Many thousand acres of land are being opened up to this cultivation in the Northern States. Many are the uses to which this tree can be put, as witness the following quotation from a report of the United States consulate-general to México:¹

“The orange leaves are the tea of the Indians and of the poor, and

¹United States Consular Reports, “Orange Cultivation in Mexico,” Vol. LIII, pp. 209-222, 1897.

in large cities, where they are peddled in the streets and sold in the markets in small bunches for 1 cent apiece, are consumed in large quantities. They are considered the best remedy for insomnia and restlessness, and are also highly commended as a night drink for children. A fine wine is manufactured from the refuse oranges, purchased at 20 to 30 cents a hundred, in Cuautla, Morelos, and Guadalajara, which retails at 50 cents a bottle.

"There are other valuable products which could be obtained, such as the distilled water of the blossoms, used for toilet purposes, worth \$4.50 a gallon; citric acid from the pulp of the sour oranges, worth \$1 a pound; a pomade, much used as a cosmetic, worth \$2.50 a pound; oil from the leaves and rind, which constitutes the main odorous ingredients of cologne waters and elixirs, worth \$3.50 to \$5 a pound, and the essential oils from the blossoms, leaves, and unripe fruit, known as *Neroli pétale*, *Neroli bigarade*, and *essence de petit grain*, high odors used by the perfumers, generally worth from \$5 to \$6 an ounce. The second oil mentioned could be manufactured at a small expense, the flowers costing not more than 12½ cents a pound, out of the numerous wild groves of sour oranges existing in the greater part of the tropical belt of México."

The orange tree can be cultivated in México on lands at an altitude from 100 to 2,500 feet above sea level. Mexican growers usually propagate the orange from the seed, although it can be reproduced more advantageously by budding, grafting, layering, inarching, and from cuttings. In the latter case the fruit appears in from four to five years, and in the former in from seven to eight years. The flower in the warmer climates appears in the latter part of October, and the season lasts throughout the whole orange territory until May. During the months mentioned the blossoms can be collected by placing mats on the ground and gently shaking the trees. Not less than from 10 to 15 pounds of fresh flowers can be obtained from a full-grown tree, and some trees produce as high as from 25 to 30 pounds.¹ A good business can be done by properly drying the blossoms, which reduces their weight to half, and druggists and dealers pay from 75 cents to \$1 per pound for these. The fresh blossom brings from 25 to 37½ cents per pound.

The yield of the orange trees in México varies considerably, soil, climate, proper irrigation, where needed, pruning, and cultivation being important factors in determining the extent of the crops. In Atlixco, Yantepec, and Tacúmbaro the trees average 860 oranges each; but in Atotonilco, Montemorelos, and Hermosillo the average yield is from 1,700 to 2,200 oranges per year, producing one crop a year. With the advantages of climate and soil, the Mexican orange tree should yield from 5,000 to 8,000 oranges.

¹ Señor Romero (*op. cit.*, p. 59) says the production of flowers per tree is from 22 to 55 pounds in the case of sweet oranges, and from 60 to 100 pounds per tree from the bitter variety.

Good orange lands can be procured in Lower California, Chihuahua, Coahuila, Sinaloa, and Durango for from \$5 to \$25, Mexican currency, per acre; in Sonora, Nuevo León, Puebla, and San Luis Potosí, from \$25 to \$50 per acre; in Michoacán, from \$5 to \$50 an acre; in Morelos, Jalisco, and Veracruz, from \$100 to \$250 an acre; in Guerrero, México, Tepic, Tamaulipas, Oaxaca, the Isthmus, and Chiapas, from \$40 to \$60 an acre. These prices are for small tracts running from 100 to 500 acres; larger tracts can be obtained much cheaper.

The United States yearly consumes about 70,000 carloads or 21,000,000 boxes of oranges; of these, 10,000,000 boxes were formerly furnished by Florida and about 3,000,000 by California. The shipment of oranges from México for the year 1896 was about 700 carloads, and during the season 1896-97 the exportation from the Republic was about 1,050 carloads. Notwithstanding the protective duty imposed by the United States up to January, 1899, the agent of the Department of Promotion of México in Kansas City disposed of 41,100 boxes of oranges, the gross proceeds of which were \$121,898, gold. During the fiscal year 1897-98 the United States imported Mexican oranges to the value of \$134,666, and during the ten months ending April 30, 1899, to the value of \$137,035.

The shipments begin about September 1 and end on December 15. It ordinarily takes twelve days, moderately fast freight, to send cars from shipping points to Chicago or Cincinnati, although some cars have made the trip in eight days. The best shipping oranges are from Hermosillo, in the State of Sonora; Montemorelos, in the State of Nuevo León; Rio Verde, La Barca, and Guadalajara, in the State of Jalisco. The next grade is from Yantepec, in the State of Oaxaca; Michoacán and Atlixco, in the State of Puebla.

The boxes generally used for shipping are imported from the United States. One or two firms in México have attempted to manufacture orange boxes, but they have not succeeded in turning out a first-class quality. The cost of a box is 31 cents; of the wrapping paper, 15 cents per box (all of which is imported); cost of packing, 36 cents per box; freight and consular costs per box from Kansas City, St. Louis, Chicago, or Cincinnati, \$2.04; and United States duties, under the new tariff act, 15 per cent ad valorem.

Below is given a table which is taken from the report of the United States Consulate-General at México, above referred to, which shows the results that can be obtained from a small tract of land of 11 acres, 10 of which are planted in oranges.

Description.	Cost in Mexican currency.
Land (from \$25 to \$100 an acre)	
Houses, one of \$350, another of \$50	\$1,100.00
Farming implements	400.00
Clearing of land	35.00
Plowing land, 104 acres, first year	77.00
Garden and seeds, half acre	21.50
Fencing and outhouses	10.00
Nursery (3,516 seedlings)	60.00
Two hundred Riverside navel trees, 80 cents each	12.30
Planting Riverside navel orange trees	160.00
Seven hundred cuttings, and planting in trench	4.00
Transplanting cuttings, second year	14.00
Transplanting 640 seedlings	14.00
Replacing, 10 per cent.	12.80
Plowing 120 acres, six years	1.30
Irrigation, seven years	120.00
Weeding and cultivating, seven years, \$40	98.00
Planting of corn, six years, 5 acres	200.00
Planting of beans, six years, 5 acres	15.00
Seed beans, \$3, and corn, \$1, six years, 5 acres each	15.00
Harvesting and shelling beans and corn, six years	24.00
Six hundred and forty buds	60.00
Manuring, six years	16.00
	30.00
Total	2,579.90
Production:	
Six years' crops of corn, 300 cargas, at \$3	900.00
Six years' crops of beans, 500 cargas, at \$5	2,500.00
Two years' crops of Riverside navels, 120,000, at \$4 per 1,000	480.00
One year's crop from cuttings, 21,000, at \$4	840.00
Total	4,720.00
Less expense and cost of land	2,579.90
Net profit at end of seventh year	2,140.10

From the eighth year on the plantation will average from 576 to 600 oranges per tree, and on the tenth year 1,000 oranges per tree, at a yearly expense of \$200 for the 10 acres. Two *peones* (day laborers) can do the general work of the plantation. These can be hired for from \$1.50 to \$2 per week each. From the tenth year forward a grower can have with all assurance a net income of \$6,000 per year out of such size plantations, if no plague or pests attack the trees; and in México the tree is not generally subject to any disease nor is it affected by any pests.

The lime, lemon, and sweet lemon are also much cultivated on the same lands that produce the orange, and they have become a large element in the country's exportations.

The pineapple is also cultivated to a very great extent. It is easily raised and needs hardly any care after planting. It has been said that the cost per plant from the seed until ready for market is not over 5 cents. It has been estimated that $2\frac{1}{2}$ acres planted in pineapples will easily produce 10,000 plants. The crop of corn which is sown among the pineapples will fully meet the expense of the cultivation of the fruit; thus the 10,000 pineapples, when planted in this way, will cost absolutely nothing. On the ground the fruit sells for about 38 cents per dozen, but exported to the United States they bring in the neighborhood of \$5 a dozen, netting about \$1,500 per acre under cultivation, and one man can easily cultivate 6 acres.

With an outlay of about \$1,200, gold, a person can, at the end of three years, have from 15,000 to 20,000 bearing pineapple plants.

The Mexican Statistical Annuary for 1897 estimates 282,456,831 kilograms, valued at \$60,157, as the product of the pineapple plantations in the country, Oaxaca being the largest producer, 281,632,000 kilograms for \$30,000.

The list of tropical fruits which the prolific soil of México produces would take too much space to be incorporated here.

Mexican official statistics give the annual product of 68 different varieties of fruits.

There is no doubt that small fruit culture offers inducements to men of small means which no other line of business will offer. The rush for silver mines, railroad concessions, and coffee plantations has caused this industry to be overlooked; but those acquainted with the conditions prevailing in México all agree that it would be a paying business, as one can do much of the work himself, or with the assistance of one or two day laborers, and with less expense, more ease, and in one-fourth the time get returns on his investment.

It has been said that of the 4,160 distinct plants which Humboldt and Bonpland counted as belonging to equinoctial America, the great majority, if not all, are to be found in México, besides a multitude of those characteristic of more elevated geographical regions.

In an official list of the flora of the hot lands of México, prepared by the Government in 1893,¹ there are enumerated 233 distinct species of medicinal plants, as well as 14 dyewoods. Among the former may be mentioned the jalap root (*Ipomœa*) and sarsaparilla (*Smilax sarsaparilla* and *Smilax arenisca*), which grow wild, both of which occupied a very prominent place in the trade figures of the country some years ago, but which have recently assumed a secondary position. The total production of these plants in 1896-97, according to Mexican official figures, was as follows: Jalap root, 179,932 kilograms, and sarsaparilla, 36,387 kilograms, valued at \$4,566 and \$4,374, respectively, Hidalgo being the largest producer of jalap root, 154,752 kilograms, and Veracruz of sarsaparilla, 25,000 kilograms.

Among the dye-producing plants are the Brazil (*Cesalpinia crista*) and Campeche (*Heamatoxylon chianum*) woods, dragons' blood (*Pterocarpus draco*), "Grana" (*Rubia tinctoria*), "Zacatlaxcala" (*Cuscuta americana*), "moral" (*Maclura tinctoria*), and indigo (*Indigofera*—two varieties), some of which are exported in considerable quantities. It has been estimated that the value of dyewoods exported by México is fast approaching the sum of \$250,000 per month. Official figures for the year 1896-97 give the following estimates of the production of these plants during the year: Indigo, 39,070 kilograms, valued at \$69,968; Brazil wood, 6,169,966 kilograms, \$154,991; Campeche or log

¹ Los Estados Unidos Mexicanos—México, 1893.

wood, 75,638,180 kilograms, \$2,099,419, and "moral" wood, 4,578,960 kilograms, valued at \$56,685. Chiapas and Colima were the largest producers of indigo, being credited with 18,200 and 10,200 kilograms, respectively. Campeche produced 3,220,000 kilograms of Brazil wood and 38,569,970 kilograms of Campeche or logwood, Oaxaca and Sinaloa over 1,000,000 kilograms of Brazil wood each, Yucatán and Tabasco 27,000,000 and 10,000,000 kilograms of logwood, respectively, and Veracruz over 2,000,000 kilograms of "moral" wood.

Fodder plants abound, the principal being the *pará* (*Chrysopogon avenaceus*), guinea grass, *alfalfa* or lucern, *ramón* (*Trophis americana*), and the *ojite* (*Brosimum alicastrum*). There are 445 classified species of graminaceous plants. A profitable crop for the irrigated lands of the plateau country is lucern. Green alfalfa retails in the streets of México City at 15 cents for 25 pounds. From five to nine crops can be raised yearly, and under good conditions the yield will be 10 tons per crop to the acre.

There are immense quantities of building lumber and cabinet woods, many species of which are yet unknown in foreign markets, although they are classed among the most precious. Half of the mahogany obtained by the United States comes from México.

An official list of the woods in Mexico in 1897¹ gives 193 varieties, among which mahogany outranks them all, with a valuation of \$1,381,984, the total production of woods being valued at \$16,204,535. Among the woods used as constructive material the principal are the "Algarrobo" (*Himenea courbaril*), "Almendrillo" (*Pomus occidentales*), "Ceiba" (*Eriodendron anfractuosum*), "Granadillo" (*Byrsonia*), "Guanacastle" (*Lignum-vitæ*), "Guayacán" (*Guayacum verticale*) ironwood (*Robinia* sp.), "Mezquitillo" (*Cassia occidentalis*), Ocote, yellow and white (*Pinus harbornei* and *P. ayacahuite*), white oak (*Quercus jalapensis*), and several others.

The following are among the principal cabinet woods in the country: Mahogany (*Suetenia mahoganii*), "Caobilla" (*Croton lucidum*), cedar (*Cedrella odorata*), three varieties, one white and two red; ebony (*Dyospiros ebenum*), three varieties, one of them called green ebony (*Chloroxylon*); "Gateado" (*Suetenia* sp.), rosewood (*Tecoma multiflora*), and several others.

Among the flora of this favored country are many trees, shrubs, etc., yielding tannic acid, among which may be mentioned the *cascalote* (*Rhus Cariaria*), *timbe* (*Mimosa* sp.), mangrove (*Rhizophora mangle*), white mangrove (*Avicennia tomentosa*), and the *canaigre*. The first named produces a very excellent tanning material from its bark. The value of the exportations of this material for the fiscal year 1897-98 was \$49,021.

The *canaigre* is a tuber, and resembles the sugar beet in shape, while

¹ Anuario Estadístico de la República Mexicana, 1897: México, 1898.

the leaf is similar to that of the rhubarb or pie plant. It is indigenous to Sonora, Chihuahua, Coahuila, and Lower California. Of recent years it has been cultivated to a considerable extent in New Mexico and Texas; but not much attention has been paid to the industry in México, although it produces from 25 to 30 per cent of tannic acid. The root can be used not only for common tanning purposes, but also for finesaddlery and fancy leathers. It can be used alone or in connection with other materials. It is noted for its quickness and thoroughness in tanning, as well as for the color, beauty, consistency, and pliability imparted to the leather.

Canaigre is a dry-climate plant, but its growth is assisted materially by irrigation. Until quite recently the root had to be gathered by digging the wild plant, but experience has demonstrated that it can be successfully cultivated, and there is no question that it improves in size, quality, yield, and in percentage of tannic acid. The annual yield per acre is about the same as that of beets (60 to 80 tons). In New Mexico the cost of cultivation per acre is about \$23.50, including irrigation and water rental; but in México, especially in the central and southern sections of the country, the rains will furnish all the necessary moisture, thereby reducing very materially the expense. This plant has only attracted public attention as a commercial product within the past five years, and it would seem that those employed in agricultural pursuits in the neighboring Republic would do well to add one more item to their productions, for it is evident that the market for *canaigre* is practically unlimited, since the oak and hemlock barks, so extensively used in the tannic industry of the United States, are becoming very scarce, and the price of tannin is constantly on the increase.

According to Mexican official statistics for 1897, the production of tanning plants in 1896-97 amounted to 29,749,842 kilograms, valued at \$278,458 silver, the production of "Cascalote" being represented by 2,010,675 kilograms for \$49,024, the balance being reported under the head of "Other tanning barks."

Yucca, called *manioca* in South America (two varieties—the sweet, *Jatropha manioc*, and the bitter, *Manihot utilis.*), is a shrub about 4 feet in height, with from 6 to 10 tubers to each plant, weighing from 1 to 12 pounds each. It is an important product of the State of Chiapas. It commences to yield, in good soil, one year after planting. The tubers, besides yielding starch, furnish food to man and cattle. Two and a half acres of land will yield 6,000 pounds of tubers, which will produce 3,000 pounds of starch.

The States of Chihuahua, Coahuila, Durango, Zacatecas, San Luis Potosí, and some others of the northern-central part of México include many districts which are eminently fitted to produce the sugar beet. This industry has not as yet taken any firm root in that country, but within a year or two last past American capital has become interested

in the subject, and in the month of June, 1897, a wealthy capitalist of Chicago leased several thousand acres of land near Tampico for a syndicate of Americans who purpose putting the entire tract in sugar beets. An immense beet-sugar factory will be erected near the land, and it is claimed that with the cheap labor procurable and the wonderful richness of the soil big profits will accrue from the enterprise.

Ginger (*Zenziber officinalis*) grows wild in various parts of México, and if properly cultivated ought to yield 4,000 per acre, according to Romero.

The percentage of arable land in México is, perhaps, as large as it is in the United States. The lowlands along the Pacific Ocean and the Gulf of México are generally well supplied with moisture by rain-falls and heavy dews, but artificial irrigation must be resorted to upon the plateaus to produce good results.

The modes of cultivation in México in many places still differ but little from those employed by the ancient Egyptians. This, of course, does not refer to large plantations, where in the last few years the proprietors have introduced modern methods and agricultural machinery. But among the small landholders and the Indians wooden-beam plows with a small iron shoe are still used. These make a furrow 5 inches wide by 5 deep. A hoe is also used, which often weighs from 3 to 5 pounds. A saw-tooth sickle completes the outfit with which the ordinary Mexican crops are raised and gathered. The plow is nothing more than a forked stick, the shorter fork being iron shod and sharpened. The longer is lashed with rawhide thongs to the yoke of oxen that draws this prehistoric implement. It takes about four men and four yoke of oxen to do the work of one man and one horse.

Up to within a very short period (and it is the case at present, except on the largest plantations) all thrashing of grain was done by driving horses or mules around in a ring upon the straw which is on the ground. The winnowing is done by men tossing the grain and chaff in the air with scoop shovels. Mexicans, as a rule, object to thrashing machines because they leave the straw whole, while by employing their method the constant trampling cuts it up as fine as though run through a feed cutter, and as straw is universally used as feed, any further preparation is unnecessary.

The grain is transported from the field to the farmhouse or station on ponderous two-wheeled carts, there being 3 pounds of cart to 1 of load for the oxen to pull. Better facilities for communication between the United States and the neighboring Republic have changed some of these methods, as before stated; but there is still one drawback to the general use of improved American agricultural machinery in the country, which, however, is gradually disappearing by the establishment of machine-repairing shops. The machinery, as a rule, is costly and

unfamiliar, and should any part of it break, rare is the Mexican blacksmith who can repair it, as usually the broken part is of cast iron, and the distance from the manufactory causes long delay and heavy expense.

Official statistics give the number of *haciendas*, or plantations, in the Republic at 8,101, devoted to the cultivations following: Cereals, 3,400; sugar cane, 1,395; henequén 395; coffee, 373; maguey (*pulque*), 279; cacao, 239; cotton, 135; magney (*mescal*), 134; tobacco, 92; cabinet woods, 69; indigo, 29; fruits, 6; grapes, 5; and 1,560 devoted to cattle raising.

CHAPTER VIII.

STOCK RAISING.

The raising of cattle has always been one of the most important industries of México and one of the least restricted by the Spaniards of the eighteenth century, who, by means of special legislation, gave encouragement to it to the extent of making it the favorite occupation of the inhabitants of the country. In earlier times cattle were of little value except for their hides, which formed an important item of export; later, however, they were turned to better advantage, the hides being manufactured into leather and the tallow used for the manufacture of soap. During the eighteenth century sheep raising also became an important industry in the northern and central provinces.

The States of the northern frontier are so well adapted to such purposes that they may be said to be immense cattle ranges. The excellent situation of the lands, as well as their generally well-watered condition, will, as has been said by persons who have given study to the matter, make México a formidable rival of the Argentine Republic.

Although the population of the United States has increased surprisingly within the past few years, there has been a large falling off in the number of cattle. Statistics show that there has been a diminution of 8,000,000 head of cattle within that period, so that it can be readily seen that cattle raising for the market in the neighboring Republic presents alluring prospects. Considerable interest has been manifested of late in this industry, and the Mexican railroad officials have been endeavoring to build it up, with marked success.

Mexican cattle as a rule are small in size, ranging between 900 and 1,200 pounds in weight. This latter weight is considered in the English market as small, and the suggestion has been made by British traders that it would be wise for the Mexican cattle raisers to import English shorthorn bulls for the purpose of breeding larger cattle. The Department of Promotion has taken a deep interest in this subject and many reforms have been introduced to the betterment of the stock. Cotton-seed meal is one of the prominent products of México, and, although it is one of the foods to be relied on chiefly for fattening cattle, nearly the entire output of this article is sent every year to the United States and Europe.

It has been estimated that the total cost of fattening a steer is about \$15, silver, and as there is an unlimited demand in Europe for choice meats at about 12 cents, gold, per pound, and no import duties to be paid, it can readily be seen that there are large benefits to be derived from the industry of cattle raising.

The States of Durango, Sonora, Chihuahua, Nuevo León, Coahuila, Tamaulipas, Veracruz, and Michoacán present admirable fields for the development of this great industry. The rich pasture lands of the latter State feed the thousands of cattle for the sustenance of the residents of the capital of the Mexican Republic.

According to the latest statistics published, in 1897, there were slaughtered for provisioning the capital 254,722 head of cattle of all kinds, weighing 21,390,688 kilograms, and valued at \$3,482,810 silver, as follows: Beeves, 94,304, valued at \$1,791,776; sheep, 99,289, at \$236,307; and hogs, 61,129, at \$1,454,727. The total consumption in the Republic during the same year was 493,454 beeves, 648,528 sheep, and 403,145 hogs, weighing in all 114,164,856 kilograms and valued at \$22,989,665 silver. The States of Chihuahua, Guerrero, Morelos, Tamaulipas, Tlascala, and Veracruz do not appear in the official list.

Some of the States above named are not well provided with water, but it has been demonstrated that with small expense all the necessary water can be obtained by the boring of wells. In the State of Guajuato a company, under the patronage of the State government, some years since bored wells and began the breeding and fattening of cattle on a large scale. This company has imported into the country a considerable number of specimens of the best breeds of horned cattle from the United States and elsewhere, and, judging from appearances, its efforts are meeting with gratifying success. The country around Tampico is wonderfully rich, the grass growing waist high there all the year round. It is deserving of investigation by those contemplating going into the business of cattle raising.

In the northern and eastern part of the Republic, lean stock can be bought at from \$5 to \$15 per head, and sold when fattened at from \$20 to \$45 per head. San Luis Potosí, southern Tamaulipas, and northern Veracruz are well adapted to cattle raising. The *pará* grass grows here in abundance. It is evergreen, very nourishing, and is a weed exterminator. It has been estimated that an investment of \$30,000 gold in this industry will yield a net profit of \$20,000 in six months.

México raises great numbers of cattle for the United States and does so under better conditions of climate than the latter country, for the stock raisers of this country lose thousands every year owing to the rigorous winters and severe summers, while in México perennial spring smiles on man and beast.

Hog raising is said to be one of the most profitable industries in which the Mexican agriculturist can engage. The native hog is hard to

fatten, but by the importation of improved stock this drawback may be promptly overcome. Of recent years breeders have been doing this, and a marked advance has been made in the industry.

Other live stock, such as horses, sheep, goats, etc., are also raised on the Mexican ranges for export.

According to Mexican official statistics, during the fiscal year 1896-97 the neighboring Republic exported live stock as follows:

Horses, 2,774 head, valued at	\$82,042
Cattle, 313,633 head, valued at	3,575,476
Sheep, 122,843 head, valued at	79,553
Mules and jacks, 4,482 head, valued at	214,918
Other animals (including 8,810 hogs), valued at.....	56,701

Making a total of 452,542 head, valued at \$4,008,690, Mexican silver.

The imports of live stock into México during the same period amounted to 5,661,686 head, valued at \$566,694, as follows: Horses, 1,983, value, \$98,218; hogs, 5,279,948, value, \$376,870; cattle, 370,508, value, \$51,828; sheep and goats, 7,329, value, \$13,556, and mules and jacks, 1,918, value, \$26,222.

The Federal District possesses fine pasture grounds, and the cattle industry is there carried on extensively, a large local trade in dairy products being one of the features of that section.

CHAPTER IX.

MINES AND MINING.

Nature has richly endowed México with resources well-nigh countless, but in the bestowal of mineral resources she has been most lavish. Beneath the surface of that volcanic ridge raised between two great bodies of water lie buried treasures incomparable, and although innumerable mining enterprises have for nearly 400 years exploited the metal-bearing regions and have extracted fabulous quantities of precious metals, by far the greater part is yet to be laid bare.

At the beginning of this century Humboldt estimated the mines in México to number 3,000. In recent years hardly that many have been worked, but the extension of the railroads and the bringing into closer communication of remote sections of the country have brought about a revival of the interest in this great industry.

The great mining region runs from the northwest to the southeast, following the direction of the Sierra Madre cordillera, extending from Sonora to the south of Oaxaca, a distance of about 2,574 kilometers. The immense parallelogram this region forms has a width of about 402 kilometers.

The richest mines have been discovered on the western slope of the cordilleras at an elevation of about from 915 to 2,440 meters above sea level.

Most of the historical mines are situated here, having been opened up by the Spaniards in 1526 and worked until 1700, with little formality and less science.

The English first undertook mining operations in 1824, and conducted them for ten years with no very profitable results.

Data collected from official sources give the number of mineral districts in the Republic as 1,092, as follows:

District.	Cinnabar.	Lead.	Tin.	Copper.	Silver, silver and lead, etc.	Gold, mines and placers.	Coal, petroleum, etc.	Total.
Aguascalientes.....	3	.....	.....	3
Baja California.....	2	12	8	1	23
Campeche.....
Chiapas.....	3	1	.....	42	8	3	57
Chihuahua.....	8	.....	7	15
Coahuila.....	63	7	1	71
Durango.....

District.	Cinna- bar.	Lead.	Tin.	Copper.	Silver, silver and lead, etc.	Gold, mines and placers.	Coal, pe- troleum, etc.	Total.
Guanajuato	27	8	14	5	89	30	3	176
Guerrero	7	1		9	61	10	2	90
Hidalgo					13	1	11	28
Jalisco	2	1		4	30	5	3	45
México	1		1		13	5		20
Michoacán	1			7	10	4	21	43
Morelos	4				13		1	18
Nuevo León		1			5			9
Oaxaca		3			11	22	13	52
Puebla		2			9	4	17	32
Querétaro		1		2	8	1	1	13
San Luis Potosí	8			1	28	2	2	41
Sinaloa		1			31	37		69
Sonora		5		7	43	43	14	112
Tabasco							1	1
Tamaulipas				2	7	2	10	21
Tepic					6			6
Yucatán							2	2
Veracruz	6	3		1	22	38	21	94
Zacatecas	12	4		1	23	10	1	51
Total	68	36	16	11	553	237	111	1,092

This table gives only the most important mineral products of what is known as the metal-bearing belt. The States of Coahuila, Nuevo León, and Tamaulipas do not lie within the limits of this region, and their mineral deposits seem to be almost entirely abandoned.

During the year 1898-99, according to the Boletín de Estadística Fiscal, the number of existing titles to mining properties paying taxes, in compliance with the law of June 6, 1892, and other regulations, amounted to 8,970, covering an area of 84,557 hectares, divided as follows among the various States and Territories:

States, etc.	Properties.	Hectares.	Areas.
Aguascalientes	98	334	42
Chiapas	11	143	.....
Chihuahua	1,092	9,035	69
Coahuila	314	5,768	75
Durango	1,460	10,041	92
Guanajuato	539	5,926	72
Guerrero	277	3,602	60
Hidalgo	463	3,526	48
Jalisco	328	1,821	21
México	242	3,020	73
Michoacán	274	3,268	29
Morelos	28	553	56
Nuevo León	199	3,995	28
Oaxaca	307	2,191	23
Puebla	68	648	78
Querétaro	55	496	31
San Luis Potosí	256	7,042	31
Sinaloa	366	3,451	47
Sonora	1,205	9,135	97
Tamaulipas	63	615	51
Veracruz	4	24	.....
Zacatecas	942	7,559	12
Territorio de Tepic	92	521	22
Territorio de la Baja California	276	1,820	81
Federal District	1	6	.....
Total	8,970	84,557	38

The class of minerals and number of claims were:

Minerals.	Properties.	Hectares.	Areas.
Gold.....	872	8,666	45
Gold and silver.....	1,932	15,763	1
Gold, silver, and lead.....	40	307	19
Silver.....	4,011	33,135	95
Silver and copper.....	192	1,637	15
Silver and lead.....	1,162	10,848	56
Mercury.....	117	5,308	61
Sulphur.....	33	147	.....
Gold and copper.....	69	857	21
Gold, silver, and copper.....	55	896	41
Silver, copper, and lead.....	12	147	15
Copper.....	221	2,183	73
Opals.....	20	55	75
Salt.....	2	20	.....
Copper and lead.....	5	31	3
Copper and iron.....	23	158	76
Lead.....	31	293	68
Iron.....	109	2,383	93
Antimony.....	39	1,547	.....
Tin.....	15	98	.....
Silver and manganese.....	3	35	.....
Silver and mercury.....	2	13	81
Manganese.....	4	7	.....
Zinc.....	1	15	.....
	8,970	84,557	38

In Chihuahua numberless mineral districts are known to exist containing more than 165 gold, copper, lead, mercury, silver, salt, and coal mines. Other minerals usually accompany the substances named, such as iron, zinc, antimony, arsenic, etc.

In the district and near the city of Chihuahua is situated the celebrated Santa Eulalia mine, one of the oldest in the country, the products of which have left a monument in the very handsome parish church of San Francisco, erected in the city between the years 1717 and 1789 with the proceeds of a tax of one *real* (12½ cents) on each half pound of silver got from the mine. The total sum thus secured is stated to be \$800,000. During the early part of the year 1897 at the properties of the Gold Hill Mining Company, in the southwestern part of Chihuahua, the result of an experimental run of 100 tons of tailings from the surface ore of the Rosario mine was a 30-ounce bar of gold. So primitive were the methods employed by the original workers of the greater part of the Mexican mines that the Indians often make a fair living by working over the tailings.

Sonora is one of the richest as well as most important mining centers. It is noted for its high-class metals, among which are gold, silver, mercury, and iron. Here abound the soft or lead ores, which are so easily worked and aid so materially in smelting. There are also other minerals, such as asbestos, copperas, magnetic iron ore, muriate and carbonate of soda, and saltpeter. Native silver is found in these districts in considerable quantities, and native iron has also been discovered in the Sierra Madre, Papaguería, and the vicinity of the Colorado River.

Sonora has lately been turning out plenty of gold, and the output

will be largely increased since the Yaqui Reservation has been thrown open. Rich placers are known to exist there, and it is expected that the influx of prospectors will be great in the near future. Over 200 prospectors went into the Yaqui country in August, 1897, and it is stated that an Arizona miner came out recently with \$80,000, the product of the work of three men during three months. Of the six millions of gold exported from México during the year 1896, three and a quarter millions were furnished by Sonora.

Sinaloa has also more than 100 mining districts, the mineral deposits being classified into six formations. Calciferous and quartz ore prevail with silver in a native state or combined with sulphur, antimony, and arsenic, with more or less traces of gold. Veins of gold-bearing quartz exist in some localities, and deposits of iron ore, sulphite of lead, zinc, copper, and silica are to be found.

The districts of Durango run mostly to silver, yet many other metals exist, such as tale and iron, the latter being found in inexhaustible quantities in the Cerro del Mercado, which is a solid mass of iron, averaging 66 per cent pure. This deposit was discovered in 1562 by Vásquez del Mercado. The *cerro*, or hill, is 4,800 feet long, 1,100 feet wide, and 640 feet high, and according to calculations, over 300,000,000 tons of solid iron might be extracted from it. From published accounts it appears that the National Mexican Iron and Steel Company, most of the stock of which is held by Americans residing in the United States, owns 111 claims and has an iron foundry at the foot of the mountain. E. Stalh Kueche & Co. own 40 claims, and sell iron to the Monterey smelters. The Monterey Smelting and Refining Company has just denounced 16 claims; Messrs. Francisco Irasoque, Diego Vereá, and Martin Saltser own 50 claims; John H. Campbell owns 41 claims, and Messrs. Carlos Bracho and Henry C. Creel own 32 claims.¹

This State has suffered greatly, owing to a lack of facilities for hauling ores; but the difficulty will soon be overcome by the building of a branch by the Mexican Central Railway.

Jalisco is another silver-producing region, and furnishes also copper and lead ores and coal.

Of the many districts in Michoacán a few only are being worked at the present time, those of Talpujahua and Angangueo. This is due to the very limited population of the State and lack of the necessary capital. The principal deposits are of copper. In 1897 a company was formed in London, with a capital of \$400,000, to carry on a general mining business in the Ario and Morelia districts of Michoacán. The Rothschilds have bought some copper mining property in this State and will build a road from the Pacific coast to the mines.

Zacatecas is the great silver-producing State. It is estimated that in the last three centuries its many mines, which were first worked by

¹ Bulletin of the Bureau of the American Republics for September, 1899, page 312.

the Spaniards in 1540, but which had previously been worked in a rude way by the Indians, have yielded over a thousand million of dollars.

Guerrero has always been considered as one of the richest mineral sections of America. Prospectors heretofore have been compelled to abandon rich discoveries on account of a lack of transportation facilities and scarcity of labor. The construction of the México, Cuernavaca and Pacific Railway has commenced to open up this wonderful country, with the result that no less than three large American companies have sent experts to investigate the marvelous wealth of this belt, which is comparatively unknown. Many natives in the State named make a living by washing out placer gold in the crudest possible manner. Experts announce that there is an abundance of gold in this portion of the country, and that the only need is the presence of intelligent prospectors to find it. The gold runs from 10 to 12½ ounces to the ton. Copper is very abundant; and there are also rich carbonate of lead ores.

The State of Oaxaca has long been recognized to be rich in gold, and much work has been done by the *arrastra* system, by which a good deal of the metal was lost in the tailings. There is the best authority for the statement that some dumps there contain thousands of tons which will assay as high as an ounce to the ton.

Guanajuato is another far-famed silver-producing State, and has been and still is the center of great exploitation. The district bearing the name of the State was discovered in 1548, and has been worked almost continuously ever since that date, the output of its mines reaching fabulous figures. Native gold has been discovered in this district, and the late denouncing and registering of mines has disclosed the presence of other minerals, such as tin and bismuth. Prospecting is still going on, and not unfrequently is the news of another rich strike heralded abroad. The estimated annual output of the mines is \$6,000,000.

In the mineral district of Querétaro are to be found lead metals, cinnabar, and the ever-present silver. The mines are numerous and important. The celebrated San Juan Nepomuceno or El Doctor mine is situated here, in the Cadereyta district. It is one of the oldest and richest of México, its production being so great two hundred years ago that it paid the Spanish Government \$18,000,000 in taxes. It is in this State that the fine opals, which reflect every prismatic color and are much sought after, are found. Great beds of these stones exist on the celebrated hacienda of La Esperanza. The opals from this place are sold in the City of México by itinerant venders at remarkably low prices.¹ The most important deposit of these stones produced some years ago from \$80,000 to \$100,000 a year.

The State of Morelos has but one mineral district worthy the name,

¹ Large opals are sold in Querétaro for \$2 each, and small ones for 50 cents.

that of Huautla, which, like most of those in the country, is silver producing.

Puebla's districts yield native gold, silver, oxide of manganese, and pyrites, as well as coal and iron ore. Here also exist quarries of beautiful onyx and what is known as Puebla marble. This onyx is much used in the United States for decorating houses and in the jeweler's trade. In the mountains bordering on the States of Zacatecas, San Luis Potosí, Coahuila, and Nuevo León extensive quarries of onyx and marble of most beautiful colors and varieties, equal in every way to the Puebla product, are being worked.

Among the mineral regions in the eastern cordillera, that of Zome-lahuacan, in the State of Veracruz, deserves mention, three classes of metal being found there—lead, argentiferous copper, and iron. Gold nuggets have been secured there also, as well as very rich malachite in scattered veins, the mother vein not having been discovered up to date.

The State of México is rich in mines of native gold and silver, as well as those of copper, iron, oxide of iron, and manganese.

The Territory of Lower California is rich in minerals. The peninsula is barren and without water. The mountain ridge forming the backbone of the peninsula is a continuation of the coast range of Upper California and is interwoven almost over its entire extent with metallic veins of all descriptions. Near San José and Cape St. Lucas there are argentiferous and auriferous outcroppings and in the municipalities of La Paz, El Triunfo, and San Antonio veins of gold, silver, iron, and other substances are exhibited on the surface of the mountains.

In the districts of Comondú, Loreto, San Luis, and Mulejé, in the northern part of the peninsula, rich copper mines abound. The Boleo mines, situated in this part, have for years been the chief source of the copper supply. There are also other metals, such as mica, iron, tin, and oxides of iron, besides gypsum, enormous piles or hills of which are to be found marble, alabaster, and sandstone. Gold was discovered near Santa Gertrudis, north of Mulejé, about 1884, and it is said that the mountains and gulches in that vicinity have rich veins of this metal.

In this district there are also solid mountains of iron. The frontier district of Lower California is noted for its gold diggings and ledges, mica, and other mineral substances, such as sulphur, soda, and salt. American capitalists are largely interested in this region.

Besides the minerals named there are in the peninsula plumbago, sulphuret of lead, porphyry, prismatic pyrites, sulphur, oxide of antimony and lead, carbonate and phosphate of lead, hydroxide of iron, and hydrosilicate of copper. Near Todos Santos some lime quarries exist.

The largest silver mining enterprise in Lower California is the Progreso Silver Mining Company, having mills and works, with improved American and English machinery, at El Triunfo. The other substances, such as antimony, lead, iron, sulphur, arsenic, etc., are not extracted but are left to run with the tailings. The ores are here milled under the lixiviation process, the absence of lead in the ores and the presence of other substances preventing smelting. In 1884 the annual copper production of the mines in the district of Mulejé was about 6,000 tons, and it has increased considerably since then.

The State of Hidalgo deserves more extended mention here, as it was in one of its districts that a miner discovered the *patio* process for reducing ores—a process which to this day is most in use in México, and one which no miner or mining engineer has been able to supersede by a more economical one for reducing the peculiar ores in which that country abounds. The great mineral district of this State is situated in the vicinity of Pachuca, the principal mines being the Real del Monte, Atontolico el Chico, and Zimapán.

Pachuca, with its rich cluster of mines, lies on a plain about 60 miles from the City of México, and is one of the oldest mining centers in the country, having been worked for more than three and one-half centuries. The district within which it lies now has a population of 98,269, a large proportion of which is Indian miners. It was here that the *patio* process of amalgamation was discovered by the celebrated Mexican miner, Bartolomé de Medina, in 1557. The very *hacienda de beneficio*, or reduction works, where this discovery was made are still to be seen in the town.

Sulphate of silver is the prevailing metal, although native silver mixed with ore is found in some of the mines of this district. Most of these mines, as well as those in other States, are still operated in the primitive Mexican fashion. The metal is brought up in rawhide sacks by means of ropes made of the fiber of the maguey wound about a large *malacate* (horse or mule windlass), and the peons or laborers carry pieces of ore weighing sometimes between 100 and 200 pounds on their backs from “headings” of the levels to the main shaft. Some foreigners are employed in the mines of Pachuca and elsewhere at good wages, but they generally are superintendents, engineers, bosses, etc.

There are in the Republic abundant sulphur deposits, particularly those of Popocatepetl, Pico de Orizaba, and Tajimaroa, several deposits of salt, rock crystal, marble, jasper, fine building stone, and the beautiful onyx of Tecali.

The most celebrated salt deposits of México are those of Peñón Blanco, in San Luis Potosí, their product containing from 70 to 80 per cent of chloride of sodium. On the coasts of both oceans there are also a great number of salt mines, the most useful being those of

Yucatán, whence comes the salt for reducing the product of the mines of Hidalgo.

México also has deposits of precious stones, such as the opal, topaz, emerald, agate, amethyst, and garnet. It is related that one of the heroes of Mexican independence, General Guerrero, possessed some diamonds which had been given him by one of his soldiers, who had found them during an expedition in that part of the Sierra Madre running through the State of Guerrero. The field or locality whence came these precious stones, of which the General gave but vague information, has been vainly sought by various prospectors. A dispatch to the daily press of the United States in June, 1897, referring to this generally accepted historical fact, reports the alleged rediscovery of these fields, but nothing further has been heard in the premises.

The most interesting fact in connection with the mining industry of México is the recent increase in her gold output. In 1893 the value of the gold produced was only $3\frac{3}{4}$ per cent of that of the silver. In 1894 it rose to about 14 per cent; in 1895 it increased from 14,896 pounds to 18,539 pounds in fine gold.

The exports of gold bullion from México since 1888-89, according to Mexican official figures, have been as follows:

Year.	Value (Mexican silver.)	Year.	Value (Mexican silver.)
1888-89	\$349,506	1894-95	\$1,139,645
1889-90	457,608	1895-96	5,246,418
1890-91	612,618	1896-97	5,858,366
1891-92	751,407	1897-98	6,364,308
1892-93	357,887	1898-99	7,347,760
1893-94	155,954		

The late Don Matías Romero, when Mexican Minister at Washington predicted that México is destined to become one of the largest producers of gold in the world, basing his prediction on the fact that heretofore the mining of gold has been merely an incident of the extraction of silver, and that when the amount of the yellow metal in silver was small it was not separated; but since the value of gold has appreciated to so great a degree the mining of the metal has assumed much larger proportions.

As regards the production of silver, according to the "International Economist" of Berlin, quoted by the consul-general of the United States at Frankfort in his report of November 29, 1899: "Enormous quantities of silver still come from the chief producing countries—México and the United States—and México especially seems to be inexhaustible." The figures given for México, in the article quoted, are as follows:

Year.	Ounces, fine.	Year.	Ounces, fine.
1896	45,719,982	1898	56,738,000
1897	53,903,180		

The exports of silver bullion since 1888-89 are as follows:

Year.	Value (Mexican silver.)	Year.	Value (Mexican silver.)
1888-89	\$6,629,260	1894-95	\$18,803,867
1889-90	7,259,956	1895-96	26,345,160
1890-91	6,751,217	1896-97	32,137,257
1891-92	6,559,668	1897-98	35,721,275
1892-93	5,148,202	1898-99	40,429,954
1893-94	3,130,823		

An American mining expert, who traveled through the leading mining camps of México in the year 1897, states that in every place visited unusual activity was noticeable; that old districts which had been indifferently worked for many years were employing larger forces, putting in improved machinery, and turning out more ore than ever before. New discoveries had been made where the ore was of a much higher grade than that produced by the mines which had been worked for two or three hundred years. Very few mines were for sale, and the prices were unusually high.

The President, in a late message to Congress (1898), affirms that since 1892 the progress in mining has been remarkable, as is evidenced by the number of new grants that have been issued. The total number of grants issued under the new law was 8,313, embracing a superficial area of 66,363 hectares. The Chief Magistrate was especially pleased with the remarkable increase in the gold output, and stated that the development of the mining industry is further evidenced by the increase in the exportation of ore. According to data published by the Department of Finance for the fiscal year 1897-98, the total value of the mineral products of all kinds passing through the custom-houses was \$91,250,000 in round numbers, showing an increase of \$10,500,000 over the value of similar products exported in the previous years. Silver figures among said products to the value of \$16,000,000, silver valuation, copper to the value of \$4,700,000, lead to the value of \$3,000,000, and on a smaller scale antimony, zinc, plumbago, coal, sulphur, asphalt, chalk, and some building materials.

From reports of the Mexican International Railroad it appears that this line alone, during the year 1896, transported silver, lead, and iron ores and bullion to the amount of 121,916 tons, exceeding the movement of 1895 by 508 carloads, or 16,612 tons. The increase in ore shipments is evidenced by the addition of three stations to those from which this commodity was formerly shipped. The Mexican Central road carries ore to the extent of 40 per cent of the total amount of its freight.

It is stated upon reliable authority that while México has produced a fabulous amount of the precious metals during the past four hundred years, there are still many sections of the country where the ground has not even been broken.

By those having knowledge of the subject it is asserted that the Mexican mining laws are better than those of the United States and that there is less danger of litigation. The heavy stamp tax results in mines being incorporated upon a small capitalization, from 2,000 to 4,000 shares, at \$10 to \$100 per share, thus preventing what is known as "kiting."

The exports of metals and other mineral substances, exclusive of gold and silver bullion, but including gold and silver coin, since 1894-95, are as follows in Mexican pesos:

Minerals.	1894-95.	1895-96.	1896-97.	1897-98.	1898-99.
Antimony	\$7,291	\$24,240	\$50,916	\$4,631,411	\$101,318
Copper	2,148,184	3,909,485	3,920,201	2,277,882	4,135,613
Copper ores	564,201	11,610	2,099	2,493,749	1,465,521
Tin	16,879	6,032	-----	2,305	4
Tin ores	2,574	778	-----	-----	298
Gold ores	59,600	160,535	349,082	389,393	992,929
Silver ores	10,935,353	10,885,479	10,680,732	11,137,996	9,854,850
Lead	1,807,402	2,531,624	2,814,084	2,909,705	3,786,144
Lead ores	20,416	23,920	118	-----	-----
Zinc ores	-----	-----	20,388	22,323	840
Asphalt	262	2,082	144	190	1,382
Quicksilver	900	3,780	3,150	-----	-----
Coal	232,919	270,176	399,474	438,216	507,902
Plumbago	33,264	8,771	8,750	8,663	18,237
Mexican gold coin	164,113	169,794	93,632	116,428	212,422
Mexican silver coin	17,077,119	20,377,663	14,578,958	18,214,989	14,116,935

Among the most recent mineral discoveries in México the following have been reported:

A large deposit of copper and silver ore, a short distance from the terminus of the Rio Grande and Pacific Railroad; in the State of Durango, a new silver mine at Coneto Camp; a valuable gold deposit at Sauces Camp, and the old Santa Fé mine at the same point is again being worked; the Eureka mine near Canatlán has been opened, and half a mile southeast of Gavalón mines a new mine of valuable silver has also been opened up. In the State of Sonora, the Mesa Quemada mines are producing good results. In working in the tunnel to communicate with the Guillermina mine a rich vein of high-grade silver ore was discovered by the operators. The placer mines of Palomas are reported as producing many nuggets of fine gold. In the State of Guerrero a new silver mine has been discovered on the banks of the Hueymatla River, near Taxco el Viejo. The discovery of a valuable vein of gold ore at a point close to Los Ollos, in the State of Michoacán, is also reported.

In the State of Tepic, the Tajitos mine near Santa María del Oro is again being worked by Mexican capital; the ore contains iron, gold, and silver. In the State of Hidalgo a new silver mine has been opened near Mineral del Oro. At Sonora, México, a deposit of sodium carbonate has been discovered 2 miles inland from Adair Bay, an indentation from the Gulf of California, 100 miles south of the mouth of the Colorado River. The deposit is said to cover an area of about 70

acres, in the center of which are several flowing springs, the water being strongly impregnated with the salts. This water has spread over the surrounding area, and evaporation has formed a crust of the crystallized salts of from 1 to 3 feet in thickness, beneath which is 12 or 18 inches of water. As this crust is excavated and taken away the water from below quickly fills its place, and very shortly, by evaporation, the crust is completely renewed, making the deposit practically inexhaustible. Sodium carbonate is used in the manufacture of acids, glass, bicarbonate of soda, etc., and there is a steady demand for it for these purposes.

It is also stated that several deposits of tin have been discovered in México, principally in the States of Guanajuato, San Luis Potosí, and Sonora. The heights of the Sierra de la Estanera, in the mining district of Comanja (State of San Luis Potosí), contain tin ore which assays from 70 to 75 per cent of metal. In the State of Durango also tin is met with in considerable quantities, which, if properly treated, would yield from 35 to 75 per cent of metal, often in the form of oxides.

There are five processes for the reduction of ore at present in use in México—the *patio*, *tonel*, lixiviation, *fuego*, and *pan*.

The *patio* process, invented, as before stated, by Bartolomé de Medina, consists of amalgamation with quicksilver. This system of treating ore is as follows:

The ore is brought from the mine in large pieces and carried to a covered box, where it is pounded to pieces by immense wooden crushers, provided at the end with heavy iron pestles, and working on arms connected with an axle, operated by horsepower. The iron pestles reduce the ore to pieces, which fall upon a sieve made of hide, the smaller fragments passing through it while the larger are placed back in the box to be crushed again. There are generally several of these crushers in a straight line, working alternately. After the ore has been crushed in the mortars (*morteros*) it passes to the mill (*tahones*), which consists of a round vat placed on a level with the floor. Here the ore is ground up into fine dust by means of three heavy and hard granite stones, oblong in shape and connected with a revolving shaft operated by horsepower.

By the gradual addition of water during this process of pulverization a muddy mass is formed, which at the proper time is thrown out into the *patio* (yard), which has a floor made of hard cement or stone, where the mud is treated by the addition of quicksilver and strong brine, called *caldó*. It is thus left in the open air, exposed to the heat of the sun, for some twenty or thirty days, being stirred every day by men and horses tramping over it until the quicksilver and the salt are well incorporated to the ore. This substance is called *torta de lama* (cake of mud), and when the process of mixing is completed the mud is

carried to the *lavadero* (washing place) and placed in vats where it is washed, leaving in the vats what is called *plata piña* (amalgamated silver), containing quicksilver. This amalgam is then placed into stout canvas bags and submitted to a heavy pressure to extract the mercury, and when this operation is completed it is placed in the oven, where the silver is purified.

An additional process connected with this system in the reduction of certain kinds of ores is employed after the mineral has been exposed to the sun in the *patio*, or yard, when it is transferred to the *planillo*, which is an inclined plane in the open air, having a solid stone floor some 60 feet long and 20 feet wide. The workmen are engaged all along this inclined plane in throwing small quantities of water on the *lama*, so that the mud runs off to a ditch while the silver remains at the foot of the plane. This method requires skill, as the water must be added gradually. The silver and the remaining muddy mass is carried to a large iron boiler where it is heated and stirred until the evaporation of the liquid is accomplished. At the proper stage of this operation the remaining substance is taken to the amalgamating room where the quicksilver is added, which unites with the silver. The mass resulting is then washed again, only the amalgam of silver and mercury remaining, which is further purified in a furnace and the silver run into molds.

In the method of lixiviation, which is adopted in several of the States, the rock is crushed dry and passed through screens of twenty to thirty meshes to the inch. It is then roasted in reverberatory furnaces with salt. The roasted ore is then subjected to the water process, being kept in large tanks or tubs, constantly covered and run over by clear water during a number of hours, after which the water is drawn off and a cold solution of hyposulphate of soda is made to pass through the ore until it is ascertained that the solution carries no more silver. The silver carried by the hyposulphate solution is precipitated by the addition to that solution of another solution of quicklime and sulphur, known as calcium sulphide, which is made by boiling lime and sulphur. After the precipitation and the running off of the precipitating liquid the silver appears as a sulphide, is put into canvas filters, dried, roasted in reverberatory furnaces to carry off the sulphur, and then melted into bars. If the operation is carefully performed the bullion resulting will be from 900 to 1,000 fine. The solution is pumped back into the tanks to be used again.

There are several kinds of silver ore taken from the mines. Some of the principal varieties are *plata blanca* (white silver), which is the rarest and best; *plata verde* (green silver), united with copper; *bronces* (bronzes), united with iron; *plomosos* (lead), united with lead, a very soft ore; *caliches* (chalk), united with a chalky substance very greatly resembling the common white limestone, but which is rich in silver

and easily worked. Previous to the passage of the tariff bill of 1890, generally known as the McKinley bill, and the succeeding tariff bills, silver-bearing lead ore was brought from México to the United States for reduction. These bills put a heavy duty on such ores, and have caused companies to form in the latter country to establish smelting works in different parts of México. Millions of dollars have been invested by American capitalists in this industry.

Wages for miners range all the way from 37½ cents to \$1.50 per day, the workmen being mostly *peones* (day laborers). Superintendents, ore treaters, etc., are generally Americans, Swedes, or Germans.

Mexican geologists affirmed for many years that no mineral coal existed in their country. About the year 1881, however, reports from several parts of the country claimed that anthracite coal had been discovered, and many specimens of what was supposed to be this mineral were sent to the National College of Engineers to be assayed. Much enthusiasm was aroused by these reports, and the Department of Promotion appointed scientific commissions to visit the alleged coal localities and report thereon. The labors of these commissions proved that coal did exist assaying from 41 to 92 per cent, the latter in the State of Sonora. It was to this coal that General Rosecrans gave the name of black gold. The commissions discovered and reported on anthracite deposits in Sonora, Michoacán, Veracruz, Guerrero, Oaxaca, Puebla, and other States.

The excitement and enthusiasm thus created led to the formation of many coal companies, and many persons looked forward to the amassing of fortunes out of collieries, but the results were not great. This enthusiasm was succeeded by a state of depression and inactivity by the discovery that the seams of coal brought to light were poor, and that the reports and rumors were exaggerated. Want of means of communication between the deposits and the markets also had much to do with the quiescent state. The depression continued until profitable coal deposits were unearthed in Coahuila, and were purchased by C. P. Huntington. These deposits occur, geologically speaking, in the cretaceous formation, and are divided into two beds, the Upper and the Lower. The product of these fields has been used to supply coke for the use of smelters in several Mexican States, and some coal has been shipped to the United States through the port of Piedras Negras. Throughout this region the coal measures are considerably disturbed by faults and foldings, and the seams are irregular in width, having many barren areas between them.

Along the Gulf of California, extending north to the Arizona line, in the State of Sonora, coal was found and used by local silver smelters as early as the year 1870. In 1890 an English company secured a concession of 4,000,000 acres of land in this belt. Through failure to carry out the terms of the concession it was forfeited, and a Mexican

company was organized to carry on the proposed work, but has done little of importance.

The coal is anthracite and semianthracite, containing from 8 to 15 per cent ash and sulphur, according to reported analyses.

Up to 1890 some 59 coal mines had been opened up in the State of Puebla, but poor facilities for transportation, difficulties encountered in mining, and the rather poor quality of the coal conspired to prevent great activity being shown, despite the desire of the State government to foster and advance the industry.

It is reported that during the fall of 1897 fairly good coal fields had been discovered near Colombia, State of Nuevo León, and that they were to be worked, a concession having been already requested to build a short railway line to the fields.

According to Mexican official publications there are in the State of Oaxaca several known deposits of coal, which is also to be found in the States of Veracruz, Puebla, Hidalgo, Michoacán, Tlaxcala, Sonora, Tamaulipas, Chihuahua, Morelos, Querétaro, Jalisco, and Coahuila. Peat is found in Sonora, Tamaulipas, Veracruz, Puebla, and elsewhere. It abounds on the banks of the Tololotlán River near Lake Chapala, and in the valley of México. Lignite, or brown coal, is found in Puebla, Tlaxcala, Veracruz, Hidalgo, Chihuahua, Guerrero, Morelos, Querétaro, Jalisco, and Coahuila.

The territory of México abounds in deposits of asphaltum and liquid petroleum. These deposits have not been, until recently, worked to any great extent.

The entire Atlantic coast of the country shows traces of oil and asphaltum, which there goes by the name of *chapapote*. In the northern part of the Republic, between the foothills and the coast, there exist springs and deposits of the substances named.

The deposits of asphaltum in the vicinity of Tuxpam and Tampico are excellent in quality, and from them the merchants of the coast have shipped, at various times, small quantities to the United States and Europe. This asphalt may be easily broken into blocks and floated down the river to the seacoast, where it may be collected and laden on ships. At Huasteca and on Lake Chapala, as well as on the Champayán Lagoon in Tamaulipas, asphalt is to be found.

Crude petroleum springs running freely are to be found on the banks of several rivers, the oil flowing into these and covering their surface for some distance. Samples of this oil have been assayed in Pennsylvania, and are reported to be of a quality equal to the crude product of that State. Late in 1896 the United States consul at Matamoros reported to the Department of State¹ the discovery, about 300 miles from his post, of "the richest asphalt field known," where there were

¹ United States Consular Reports, Vol. LII, p. 619.

“about 20 wells which have a continuous flow of mineral tar, as the analysis (made at the University of Texas) call it. The ground for over 20 miles square is covered with asphalt deposits. The nearby streams have the whole year round a fatty, oily substance flowing into them from the surrounding mountains, making the water unfit to drink. From all indications there must be a large deposit of petroleum and coal under this asphalt field.”

Mineral oils and petroleum have been found in many other localities, principally in the Villa de Guadalupe Hidalgo, Lake Chapala, Puerto Angel, and Pochutla, in the State of Oaxaca; in Oztumatlán, Michoacán, and in several other places.

Under date of June 15, 1898, a concession was granted to a London firm, by the Mexican Government, for the establishment of the industry of petroleum extraction, according to the provisions of which the said grant was to hold for a period of ten years.

The mining law now in force in México was promulgated on June 4, 1892. Its leading provisions are as follows:

A concession is required for working the mineral substances here enumerated: Gold, platinum, silver, quicksilver, iron (except marsh ores, loose surface ores, and others worked as coloring matter), lead, copper, tin (except float tin), zinc, antimony, nickel, cobalt, manganese, bismuth, and arsenic, either in their native state or mineralized. Also precious stones, rock salt, and sulphur.

Combustible minerals, mineral oils and waters, rocks on the land, either separately or as building or ornamental material; earths, sand, and clays of all kinds, and mineral substances not elsewhere specified may be freely worked by the owner of the ground where they exist without a special concession in any case. Surface or subterranean excavations that the working of any of these substances may require are subject to the regulations relating to the order and safety of mines.

Payment of the Federal property tax, prescribed by the law relating thereto, will convey the fee title to all mining property legally acquired under this law. Mining property, except in the case of placers or surface deposits, is understood to refer solely to the underground work and not to the surface, which remains under the jurisdiction of its owner, save such parts thereof as may be needed by the miner, relating to which the law makes sundry provisions.

A mine can not be worked beyond its prescribed boundaries, save when the adjacent ground is unoccupied, and then only conformably to the regulations and after petitioning for an enlargement of the concession. In order to occupy another's land his permission is indispensably necessary, except in the case of easements.

Water brought to the surface by reason of underground work shall belong to the mine owner; but the general provisions of law must be observed with respect to the rights of the owners of the land over which the same may flow.

Mining operations being deemed of public utility, in case of failure to agree, condemnation proceedings may be resorted to for the acquirement of the necessary ground.

Should efforts on the part of mine concessionaires to make arrangements with landowners looking to the occupancy of the necessary portion of ground to conduct the working of placers or surface deposits or to construct buildings and other mine appurtenances fail, condemnation proceedings must be instituted before the local court of the first instance, where the proceedings shall be as follows:

Each party shall name an appraiser, who shall, within eight days, reckoned from the date of appointment, present his respective report. In case of disagreement, the court shall appoint an umpire, who shall also file his report within eight days after his appointment. Within the next ensuing eight days the court, after considering the opinions of the appraisers and the evidence submitted by the parties, shall determine the extent of ground to be occupied and the amount of indemnity to be paid. From this decision no appeal lies.

Should the owner of the land fail to name his appraiser within eight days after notice from the court, the latter shall, on its own motion appoint one to represent the owner's interests.

Should the ownership of the property to be occupied be uncertain or doubtful, the court shall set as the amount of indemnity such sum as may be agreed upon by the appraiser appointed by the grantee of the mine and the one designated by the court to represent the legal owner, the sum being deposited to be delivered to the party entitled thereto.

The appraisers shall base their valuations upon the value of the land, the injuries immediately accruing to it, and the easements attachable thereto.

Mining properties and adjoining lands shall enjoy and suffer, as the case may be, the easements of way, water rights, drainage, and ventilation, the courts being guided in the matter of adjudication and indemnity by the *lex loci*, where the same does not conflict with the rules which are laid down in this law.

Every inhabitant of the Republic may freely explore the national territory for the purpose of discovering mineral deposits, but should excavations be made in lieu of borings, the former shall not exceed 10 meters in length or depth. No permit is necessary, but previous notice must be given to the proper authority.

No prospecting may be done on private property without leave of the owner or his representative. In case permission is not obtainable, it may be asked of the proper executive officer, who may grant the same pursuant to the regulations, bond being previously furnished by the prospector to answer for all damages, such bond to be to the satisfaction of the officer after hearing the owner of the land or his representative.

No prospecting may be carried on within private buildings or their appurtenances except by leave of the owner; neither shall mining explorations be conducted within the limits of towns or cities, nor within or in the neighborhood of public buildings and fortifications.

The unit of concession, or mining claim, shall hereafter consist of a prismatic body of indefinite depth, forming on the surface a horizontal square having sides 100 meters in length, and bounded below the surface by the four corresponding vertical planes.

The mining claim is indivisible in all contracts affecting mining grants or ownership thereof.

Unless the original prospector shall petition therefor within three months, mining grants shall be made to the first applicant and shall embrace, wherever there is sufficient unoccupied ground, the number of claims petitioned by the interested party, who should always clearly specify, in accordance with the regulations, the actual location of the claims constituting his grant.

Should a space less than the unit of concession lie between the newly granted claims and others previously conveyed, such space shall also be granted in fee to the first applicant.

Applications for mining grants should be filed with the special agents appointed in the States, Territories, and Federal District by the Department of Promotion. These agents are authorized to collect the fees prescribed in the department schedule.

The agents shall receive the applications, immediately recording the day and hour of filing. They shall then publish the application, cause the claims to be surveyed by the engineer or expert by them designated, and should no objection be filed, they shall forward a copy of the record and plan to the Department of Promotion for approval and issuance of the patent.

The record having been approved and the patent issued, the grantee enters at once upon the mining claims without further formality.

The agents are prohibited from suspending the record in its regular course for any reason whatever, except in the event of objection; and the periods established by the regulations having expired, they are bound to transmit at once a copy of the record, in whatever stage it may be, to the department, so that, after examination, it may dismiss the application for want of diligence should it so find, or hold the agent responsible should the delay be attributable to him. Negligent applicants can not twice solicit the same grant.

Should objection to the granting of an application or to the proper surveys be filed by the owner of the land, alleging the nonexistence of the deposit, the agent shall dismiss the objection should there be any indications of a deposit on the land or any boring or prospecting work on said deposit.

In case no such indications, borings, or works exist, proceedings

similar to those hereinbefore mentioned shall be instituted, the court deciding whether or not the grant shall be made, his decision being appealable in either case. The judgment is to be communicated to the Department of Promotion.

The agents shall suspend proceedings in case an objection is filed, and forward the record to the local court of the first instance for the institution of the proper judicial inquiry. The court shall make known its decision to the Department of Promotion.

Working of mineral substances, either conveyable pursuant to this law or belonging to the owner of the surface ground, is subject to the regulations; but, by observing these, mine owners shall be allowed full liberty of action to work as may seem best to them, pushing, delaying, or suspending for a greater or less time their work, employing therein the number of laborers they may see fit and wherever may best serve their purpose. Mine owners, however, shall be liable for accidents that may occur in the mines due to poor workmanship, and to indemnify the damages occasioned other property through lack of drainage or through any other cause affecting the interests of others.

When, in order to push the works of a mine in any locality, drainage tunnels may become necessary, the execution of such works shall be the subject of contract between the parties interested.

Associations or companies formed to operate mines shall be governed by the commercial code.

The contract for advances (*de avío*), so called, up to this time, shall hereafter be considered either as a partnership—in which case it shall be governed by the commercial code—or a mortgage. A mining mortgage may be freely constituted in accordance with the civil code of the Federal District, bearing in mind the indivisibility of the claim hereinbefore mentioned, and, as regards recording, observing the provisions of the commercial code, to which end a special book shall be kept for mining operations. The mortgagee shall always have the right to pay the Federal tax hereinbefore mentioned, and shall thereby acquire a preferred right with respect to the owner of the mine and his own mortgage.

Mortgages may be divided into bonds, assignable or payable to bearer, either by the terms of the original mortgage deed or by subsequent instrument. In every case it shall contain provisions constituting a common representative of the bondholders. These provisions, as well as those relating to the aggregate of the debt, the conditions thereof, and of the security, shall be printed in the bonds.

Bondholders may only proceed against the mortgagor or the mortgaged property through the common representative, whose acts with respect to said right shall be binding on all.

Failure to pay the property tax, pursuant to the provisions of and procedure under the law establishing the same, shall be, from and

after the date hereof, the sole cause for forfeiture of mining property, which property so forfeited shall be free of all burdens and may be granted to the first applicant.

All matters relative to the establishment and working of smelting and reduction works and assay offices shall be governed by the general laws, and in so far as regards taxation by the law of June 6, 1887.

Parts of tunnels located outside of claims, when intended solely for ventilation, drainage, and extraction of metals not taken from the said tunnels, are exempted from taxation.

Denouncements of mines or surplus ground in the course of adjudication when this law goes into effect shall be decided in accordance therewith.

Surplus ground and vacant spaces between adjoining or abutting mining properties not denounced when this law goes into effect shall belong and be granted to the first applicant.

The law went into effect on the 1st of July, 1892.

On June 6, 1892, the President promulgated, through the Finance Department, a mining-tax law, the principal provisions of which are as follows:

Pursuant to the new mining law, a Federal mining-property tax is established. It is dual in its application—one to be paid but once in stamps to be affixed to every title or patent, and the other to be paid annually for each claim which a grant covers. Every fraction of a claim exceeding the half of a full claim shall pay the same as the latter. Smaller fractions are exempt.

The stamps shall be of the denomination of \$10, and are to be affixed to the title or patent at the rate of one stamp for every claim of 10,000 square meters. Fractions are to be paid for as above.

Every mine owner or occupant is bound to pay the sum of \$10 per year for every claim composing his grant.

This annual tax is to be paid quarterly in advance, payment to be made during the first month of the quarter, without notice.

Any concealment of the number of claims owned shall be punished with a fine in double the amount of the stamps the patent or title should bear for the claim concealed; and further, a fine in double the amount of the annual tax for the whole if it shall not have been paid, without prejudice to civil and criminal liability.

Default in the payment of the annual tax within the first month of the quarter will subject the mine owner to a fine equal to 50 per cent of the tax, if paid during the second month. Should payment be deferred until the third month the fine shall be equal to the full amount of the tax. Upon the expiration of this term without payment of the tax and accumulated fines the mine is forfeited without appeal.

Upon the sale of a mine the grantor shall give notice of the same for record, and the deed shall have affixed the stamps required by the law.

In case any person or company shall find it inadvisable to continue the working of a mine or mines, notice must be sent to the proper office of the Treasury Department in order to settle the tax up to the date of notice and make the necessary entry in the record.

On July 1, 1897, another mining-tax law went into effect. Its provisions are as follows:

ART. 1. Silver and gold are subject, in accordance with the provisions of this law, to the payment of the following taxes and charges:

I. Interior stamp tax, at the rate of 3 per cent on the value of said metals.

II. Coinage charges, at the rate of 2 per cent on the value of the same metals.

III. Assaying charges, in conformity with the tariff which the Department of the Treasury may publish.

IV. Charges for smelting, refining, and separating in accordance with the respective tariffs which may be published by the same Department.

ART. 2. In order to liquidate the stamp tax and coinage charges, the basis for estimating the value of the precious metals shall be the value which the monetary laws of the country assign to the said metals, i. e., the kilogram of silver being at present \$40.915 and the kilogram of gold \$675.416.

ART. 3. The cost of the respective operations will be taken into account in connection with the tariff which clauses III and IV of article 1 establish for the collection of the charges.

ART. 4. Not merely gold and silver in mixed bars, or consisting of one of these metals, but also sulphides of silver, argentiferous copper and lead, mineral in a natural state, or concentrated, or which may have been to a certain extent treated, and generally any other ore or substance which contains silver or gold, are subject to the payment of the taxes and charges established by article 1.

ART. 5. The stamp tax and coinage and assay charges shall be paid in all cases, whether it be that the substance is presented for coinage or for exportation. The smelting charge shall only be collected on the substances which are not homogeneous and therefore require to be smelted in order to effect the assay valuation and liquidation of same; and the charges for refining and separating shall only apply to the substances intended for coinage.

Foreign money is not liable to the burdens imposed by this law, but it shall be subject when introduced to a mint—for purposes of recoinage—to the payment of the coinage charges, and also in proper cases to the charges established in sections III and IV of said article.

ART. 6. The payment of the respective taxes and charges shall be made at the mints or in the special assaying offices, whether the metals be introduced for coinage or for the purpose of exportation, and in

each case the requisites established by the Regulations must be complied with.

The taxpayers who can not prove that they have paid the taxes in the establishments mentioned, and who may wish to ship gold or silver, or any substance which contains these metals, to a foreign country, shall be allowed to make the payment at the custom-houses upon the terms and requirements of the said Regulations.

ART. 7. The payment shall be made in current money of Mexican coinage, but as regards the stamp tax the collecting offices shall affix to and cancel on the respective documents which they shall deliver to the taxpayers the corresponding stamp for the amount of said tax. These documents shall be made out in the form which the regulations shall provide, specifying the value of the metal and the amount of the tax and charges.

ART. 8. When the minerals destined for a foreign country come from any State in which they have been taxed in conformity with the law of the 6th June, 1887, the coinage charges and stamp tax may be liquidated, taking as a basis—always provided that the Department of the Treasury has so authorized—the value which has been given to the minerals in the assaying office or in that of the collector of taxes.

ART. 9. The metallurgical establishments, which by express stipulation in force at the date of this law enjoy the privilege, shall continue to enjoy the privilege of exemption from the payment of the coinage tax upon the silver which they may export direct, provided always that the proportion of silver in the argentiferous leads does not exceed seven one-thousandths and that of the argentiferous copper twenty one-thousandths; but if the proportion of silver exceeds these limits, the said establishments shall pay the coinage tax upon the excess. This exemption applies only to those products which originally proceed from the establishments enjoying the franchise, and not to those products purchased from other concerns.

ART. 10. The coinage and stamp tax on gold, according to the law, shall be estimated upon the intrinsic value of the precious metal contained in the minerals which are exported, with only such exceptions as are contained in the following articles.

ART. 11. The mineral substances which contain less than 250 grams of silver or 10 grams of gold per ton are exempted from the payment of the tax and charges imposed by this law, the proportion between the one and the other limit to be taken into account in case of a combination of both metals.

ART. 12. The mineral substances of gold or of silver which may be exported in their natural state, or after mechanical concentration, shall be liable to the coinage charge and also the stamp tax upon the gold and silver which they contain, 10 per cent being deducted.

ART. 13. Should the Department of the Treasury see proper it may

grant special concessions to the concerns which are in the habit of exporting ores in large quantities, provided that such concerns satisfactorily prove by means of their books and other documents the weight and proportion of metal of the ores which they wish to export, and that they admit, for this purpose, the unconditional investigation of the Treasury agents. This concession may be extended to arranging with the exporters for the payment of a fixed sum as remuneration of the Government for the cost of the assay and inspection of said mineral substances; but in no case shall it allow of an exemption from or rebate on the stamp tax and coinage charges established by this law.

ART. 14. The Regulations shall fix the penalties which violators of this law shall incur and the mode of making the same effective, placing clandestine exportation on a level with contraband, and punishing it with the penalties which for this offense are imposed by the general custom-house ordinances and other relative laws.

ART. 15. The producers of silver which contains gold are at liberty to separate the same in their own private establishments; and in case that they introduce silver mixed (with other metal) to any Federal Government office, they shall have the right to separate the gold to the extent that they may desire, paying the respective tax or charge per kilogram, in accordance with the tariff. If the producers do not fix the extent, the separation shall be made on their account, when the proportion of gold is equal to or greater than two one-thousandths.

ART. 16. The rates fixed in the general stamp law for the "accounts" issued by the mints and for the "metals of gold and silver" are repealed; the laws and provisions at present existing with reference to the Federal taxes and charges on gold and silver are also repealed.

The States can continue collecting the local taxes authorized by the law of the 6th June, 1887, which shall be liable to the Federal contribution mentioned in the stamp law.

CHAPTER X.

INDUSTRIES AND MANUFACTURES.

México is not a manufacturing country. Such articles as the mass of the people require are, however, generally produced in sufficient quantities to meet the demand. She is, since the great depreciation of silver, beginning to learn that it is cheaper to make than to buy, and within the past three or four years very large amounts of capital have been invested in manufactories and industries. México will hardly become, for very many years at least, a manufacturer of articles beyond those of which she produces the raw materials; but this would furnish a field for the investment of almost limitless capital, for hardly any nation on earth furnishes raw materials in so great abundance. Manufactures will spring up with the increased production of raw materials, but the country's agricultural resources are so great it is destined to become, still more than at present, a great exporter of raw material. The natural products of the soil are so varied, so certain, and so sure of good markets, that capital is diverted to agricultural and mineral development rather than into manufacturing enterprises on a large scale.

The Indian, who forms the greater part of the laboring population, is not progressive. He is loth to lay aside the rude implements of his forefathers and take up methods of modern invention and advancement. His needs are few, and he is not inspired with a desire to improve his condition. Having inherited nothing but tradition and the meager physical means to provide for his sustenance, he zealously guards the one and utilizes the other to the same extent as his forbears, leaving his children only what he himself received. The three centuries of Spanish domination have left their imprint upon his character, and everything he does is executed in a perfunctory manner. He goes to his daily toil early and returns to his frugal meal and rest late. Ambition within him is dead. He is satisfied with his lot and cares little what the morrow may bring forth. But the Indian is losing ground. The white races are surpassing him, and with increasing transportation facilities, a progressive Government fostering industrial interests, the disappearance of internecine strife, the influx of foreign capital and enterprising men, his successors will, in the not very distant future, either join the ranks of the progressive people, as

in the thickly populated portions of the Republic they have already begun to do, or die off to be replaced by a more energetic and ambitious class.

Time was when México was regarded by natives and foreigners as a land of mineral wealth only, and her many other natural resources were but little noticed or developed. The building of great railway systems, affording better means of communication, has, however, brought to the notice of the world at large the great possibilities for wealth earning which the country affords.

Brantz Mayer,¹ writing of México and a portion of the territory of that country which but a few years before had been annexed to the United States, said:

“California has, at least, illustrated one great moral truth which the avaricious world required to be taught. When men were starving, though weighed down with gold—when all the necessities of life rose to twice, thrice, tenfold, and even fifty or a hundred times their value in the Atlantic States—that distant province demonstrated the intrinsic worthlessness of the coveted ore and the permanent value of everything produced by genuine industry and labor.”

Spurred on to a recognition of this truth by exchange, which has acted as a protective tariff, the country, which knew practically nothing but mines, began, a few years since, to manufacture, and to-day the whistle of the mill and the sound of the hammer are beginning to be heard throughout the land. Many articles which five or six years ago brought the Government millions in duties are now not imported, the people having gone into the manufacture of these articles, which thus produce revenue to the Government through other channels at the same time that they add to the wealth of the people.

The principal manufacturing industry of the Republic is the making of cotton cloth, mostly *manta*, a coarse, unbleached cotton fabric. It has been estimated that the mills of the country consume annually 26,000,000 pounds of cotton, quite a large portion of which is imported from the United States, it being stated that the value of the unmanufactured article so imported is \$2,000,000 a year. The industry gives work and support in the field and mills to more than 50,000 families. As a rule the mills are provided with old-style machinery, but recently a number of them have set up American and English machinery of modern type. The ordinary cotton cloth (*manta*), which is about the only material for clothing used by two-thirds of the inhabitants of the country, is usually made up in pieces of 30 yards 4 inches in length by 34.12 inches in width. The price of the piece varies from \$2.88 to \$4.

¹Mexico, Aztec, Spanish, and Republican, 1852.

In the year 1895-96 there were in the country 101 cotton and print mills. The following table gives their location, number, number of spindles, looms, stamping machines, and operatives:

Location.	Number of mills.	Number of spindles.	Number of looms.	Number of stamping machines.	Number of operatives.
Chiapas	1	1,240	54	.....	70
Chihuahua	2	2,100	108	.....	132
Coahuila	7	28,778	863	1	1,347
Colima	2	2,824	64	.....	218
Durango	8	14,612	561	.....	806
Guanajuato	4	10,500	448	.....	825
Guerrero	2	3,318	130	.....	149
Hidalgo	1	4,968	190	.....	323
Jalisco	5	22,281	464	2	940
México	6	28,856	964	3	1,710
Michoacán	1	11,200	286	.....	425
Nuevo León	2	11,176	285	.....	453
Oaxaca	3	18,744	542	.....	775
Puebla	14	49,964	1,695	1	2,199
Queretaro	4	25,232	692	3	1,199
San Luis Potosí	1	4,640	138	.....	266
Sinaloa	3	4,752	209	.....	383
Sonora	1	1,874	64	.....	120
Tlaxcala	6	23,300	678	3	1,025
Veracruz	9	82,493	2,352	6	3,003
Yucatán	3	11,448	337	.....	550
Federal District	13	66,068	1,870	11	2,943

In the last six months of the above year there were consumed 11,885,613 kilograms of cotton; there were manufactured 4,561,386 pieces of cotton cloth and prints; there were also produced 1,007,558 kilograms of yarn. The sales during the same period amounted to \$11,828,766.69, Mexican currency.

In the year 1897 the number of mills had increased to 111, and in 1898-99, according to an official report of the taxes paid by cotton and woolen goods, there were 125 mills, with 491,443 spindles and 14,759 looms, employing 23,731 hands. From July 1, 1898, to June 30, 1899, the consumption of these mills was represented by 26,518,059 kilograms of cotton, their production being 10,239,799 pieces of goods and 1,896,042 kilograms of yarn, with a total valuation of \$29,753,414, Mexican silver. This seems to be one of the most flourishing industries of the Republic, some of the mills paying annual dividends of 40 per cent on the investment.

Besides the cotton cloth and prints, a considerable amount of cotton yarn is used in the manufacture of *rebozos* (an article serving as a shawl and scarf for women), blankets, and coarse napkins. The best *rebozos* are made in the town of Tenancingo. The articles named are also manufactured of silk and linen. There are in the City of México several factories devoted to the manufacture, by hand, of *zarapes*, *rebozos*, *mantas*, and other cotton stuffs.

The manufacture of knit goods, such as hosiery, underwear, etc., has increased considerably, and has resulted in making a very noticeable reduction in the amount of imported goods of this character. The cloth made is of a fair quality, and sells at from \$1.62 to \$2.62 per *vara*;¹ carpets bring from \$1 to \$1.30 per *vara*.

¹ A *vara* is 34.12 inches.

As demonstrative of the profits to be made in the manufacture of cotton textiles, it has been stated upon good authority that one of the large corporations in Orizaba paid its shareholders in the year 1896 16 per cent. In the Federal District another company divided, during the same year, among its shareholders a profit of 15 per cent. The thread factories and cotton goods manufactories owned by individuals are said to make annually between 30 and 40 per cent on their capital.

According to later official reports there are now in the country 130 cotton mills, whose estimated payments to the National Treasury in the form of stamp taxes for the first half of the fiscal year 1899-1900 are given at \$849,911, Mexican silver. Among the additions to this industry is the reported establishment in the district of Atlixco of a thread and cotton mill; also one at Orizaba, which is the second largest in the Republic, fitted with electric lighting appliances and having a capacity of 150 bolts a day. In León, the capital of Guanajuato, there are 500 looms now in operation, and the "Industrial Company" has erected mills both at Veracruz and Orizaba.

Mexican industry also produces woolen blankets and blankets of a mixture of wool and cotton, cassimeres, which, although they have not the body and fineness of texture of those of European manufacture, have, on the other hand, great resistance, and are cheap. The *zarapes* constitute, perhaps, the most profitable industry. These multicolored woolen cloaks or blankets are well made, those of Saltillo and San Miguel being celebrated for their fine texture, brilliant colors, good finish, and excellent wearing qualities. They have achieved considerable fame abroad, and some grades have been sold for more than \$100 each.

The principal woolen mills are in Aguascalientes, Durango, Guanajuato, Hidalgo, and Puebla. San Luis Potosí, Zacatecas, México, and Nuevo León also have woolen mills which produce a fair quality of goods.

It is not generally known that wool spinning has been going on in México for more than three centuries, yet such is the well-authenticated fact. In the year 1541 the first viceroy introduced Merino sheep into the country and established manufactories of woolen cloth.

Silk weaving can hardly be said to be a great industry at present, but it is increasing rapidly. Silk was cultivated and sold in the markets of México as far back as the time of Charles V, Cortés speaking of the fact in his letters to that monarch, and there are still preserved pictures done by the ancient Mexicans upon a paper made of silk. The culture of the silkworm and weaving of its product were prohibited by the Spanish Crown in its American possessions during the vice-regal administrations as stated elsewhere. The industry gradually died out, and it is only of late years that it has been revived.

The climate of México is unexcelled by any in the world for the raising and developing of cocoons. The silkworms at the present time are mostly raised in Oaxaca, in the State of the same name Tetela, in the State of Puebla; Ixmiquiltam, in Hidalgo, and in the States of Jalisco, Oaxaca, Tlaxcala, Michoacán, Querétaro, Veracruz, Chihuahua, and Zacatecas. The white and black mulberry leaves grow well in these States and in the Federal District. In 1886 there were four silk factories which could be considered to be fairly well equipped. They had plants of machinery imported from France, and, although small, were in the hands of enterprising men, and it was thought at the time that these factories and others, which it was said would be established, would manufacture more silk than could be consumed by the people of México. Statistics do not show that the outcome of this undertaking has been as successful as was expected. Although several of the State governments in the year 1886, prior to that time, and since then, offered inducements to those persons who should devote themselves to the growing of mulberry trees and the establishment of silk factories, success does not seem to have attended any of the efforts in this line. There is now one silk factory in the City of México, which is pronounced to be producing a very fair grade of goods.

There is a colony devoted to the raising of silkworms.

A silk grower of San Luis Potosí has imported 500,000 mulberry trees from France, and in order to encourage the silk industry the trees were permitted to enter free.

Considering the great quantity and variety of fibrous plants and other material for paper making with which México is endowed, and that this industry has been protected for many years by the tariff, it seems strange that throughout the entire territory there are only a few paper mills, which manufacture comparatively little writing paper, but a considerable quantity of wrapping and printing paper, envelopes, etc. The oldest mill is that at Cocolapan, in Orizaba, which produces a straw and printing paper of a low grade.

Under date of June 3, 1899, the legislature of the State of México granted the joint stock company known as "El Progreso Industrial," engaged in the manufacture of paper from the "maguey" fiber, exemption from all State taxes and contributions for the term of ten years. The company's mills are situated in the districts of Tlalnepantla and Cuautitlán. About 1,600 men were engaged in erecting the buildings. The engines will be moved by hydraulic power of 1,500 horsepower. The mills will be able to produce in large quantities all kinds of paper, especially those of superior quality.

Save in the State of Morelos and some districts in the States of Puebla, Veracruz, Michoacán, and Jalisco, and the Territory of Lower California, the sugar industry is very backward. In most of the sugar

mills the juice of the cane is extracted by wooden cylinders, and boiled down to the necessary consistency to form small tablets or cakes (called *panelas* or *piloncillos*) of a dark brown saccharine substance called *panocha*. Except in rare cases, the use of steam and modern machinery is unknown. That this is a profitable industry is shown by the fact that the sugar mills of Tenango, Santa Clara, and San Ignacio, in the State of Morelos, paid back to their owners the total of their investment within four years.

Distilleries are to be found all over the country, yet very few of them have modern plants. These distilleries are chiefly engaged in distilling the liquor *mescal*, which has been described in another part of this book. Another liquor made in México is distilled from the sugar cane and is called *aguardiente* (burning water). It is one of the strongest liquors known.

A very fair native wine and brandy are made of the grapes, but this industry is not a prominent one and does not supply the home demand.

Beer and pale ale of an excellent quality are produced.

Official figures for 1898-99 show that there were then in the country 2,211 establishments devoted to the manufacture of spirits, from sugar cane, maguey, grapes, grains, etc., which produced during that year 39,311,731 liters of spirits, the principal production being from the sugar cane, 27,219,239 liters; from the maguey, 8,644,979 liters, and 2,299,242 liters of grain spirits. The number of stills in use amounted to 2,638, with a capacity of 1,245,825 liters.

The tobacco-utilizing industry is extensive, nearly every town and hamlet having its cigarette factory. The largest manufactories of cigars and cigarettes are in the Federal District, Puebla, and Veracruz. Cigarettes are very cheap, 700 to 800 selling for a dollar. Good brands of cigars may be purchased at from \$35 to \$80 per thousand, Mexican currency. This industry is a profitable one, as it has been stated that a cigarette manufacturing company started operations the 1st of January, 1894, with a nominal capital of \$1,000,000, introducing the most perfect methods for the manufacture of that product. The first year the company paid dividends of 14 per cent, in the second 15 per cent, and 17 per cent in the year 1896. This result is the more notable, inasmuch as the company at the time of its formation into a corporation had placed its capital at double the value of that which the business really represented.

The quantity of tobacco manufactured in the country in 1898-99 amounted to 5,546,677 kilograms.

Although there are many flour mills in the country they do not by any means supply the local demand. Nearly all these are supplied with millstones from France, and the machinery in the majority of them is not up to the standard. There are over 50 good merchant mills in México, ranging in flour-making capacity from 40 to 250 bar-

rels a day. At least 150 smaller and crude establishments are scattered throughout the Republic. None of these mills, however, can be said to be properly equipped, all being in need of wheat washing and scouring plants.

Iron foundries are numerous, the excellent quality of the Mexican minerals and their abundance making it possible for them to turn out good work. In most of these foundries the work is limited to the manufacture of smaller agricultural implements and ordinary marketable iron, although some large pieces have been manufactured in the way of sugar-making machinery and other heavy work. There is little doubt that at no very distant day this industry will be exploited to a much larger extent than it is at present. The Government maintains a large arsenal and gun foundry in the City of México, where arms and munitions of war have been produced which speak highly for the skill and dexterity of the operatives in the establishment. There is also a large type foundry located in the same city, which turns out excellent work.

Figuring among the prominent industries of the Republic is hammock making. This is principally carried on in the State of Yucatán, where hammocks have been articles of use and barter from time immemorial, which fact has been demonstrated by the discovery in buried cities of hammock beams and hooks. Yucatán exports more hammocks than any other province in the world. These articles are made from the fiber of the *henequén*, and are woven entirely by hand, with the aid of a very few primitive instruments. All that is necessary to make a hammock is a couple of straight poles and shuttles, a thin slat of *zapoli* wood, and a pile of *henequén* leaves. With these articles at hand a Yucatán native is prepared to accept contracts for hammocks by the piece, dozen, or hundred. The great hammock-making district, whence comes the best make and which produces more than all the other districts combined, is Texcoco. Almost the entire exportation of these articles is consumed by the New York market. The Indian women are those principally engaged in the industry.

Pottery is classed as a third-rate manufacture of the country. It is carried on everywhere. The cities of Guadalajara, Zacatecas, Guanajuato, and Puebla may be said to be the centers of the industry. The pottery and crockery of the various localities or districts where manufactured has its peculiar distinctive features of quality, design, and color.

The Guadalajara ware is gray, as a rule soft baked, polished, and often very elaborately decorated in colors, gold and silver. The Zacatecas ware is red, hard baked, glazed, and decorated rudely with splashes of underglaze color. The Guanajuato article is in dark brown or dark green, with ornamentation of figures, and with a soft, rich glaze. In Puebla a coarse porcelain with a thick tin glaze is

manufactured. Very fine glazed tiles, multiformed and vari-colored, are made in this city, specimens of these ornamenting the exterior and interior of the churches, which abound in the city named and other cities and towns of this historic State. In some parts of the Republic a curious iridescent ware is made which has a copper glaze.

The crockery for table use is generally heavy and in white and blue. In many places the Indians are adepts in the manufacture of earthenware, and the Mexicans generally are skillful in the making of wax, clay, and rag figures, which is one of their profitable industries. In Guadalajara, the capital of Jalisco, and Tepic, in the territory of that name, vast numbers of clay images, well molded and painted, are made. Foreigners are amazed at the perfect accuracy displayed by the humble artists in reproducing costumes and portraits from life or photographs. The rapidity with which the modelers perform their task is wonderful. Some of the clay and wax work manufactured by the deft fingers of the natives has been deemed worthy to rank with works of sculpture. The specimens of Mexican handiwork in wax which adorn the numerous churches do the artists great honor. No city in the Republic of any pretension is without the vender of rag, baked clay, and wax images, crying his wares.

Ever since Cortés placed his foot upon the soil of the New World pearl fishing has been carried on in the Gulf of California, which, in the early days, bore his name. The industry was pursued for many years in a desultory way, the only persons engaged in it being a few Indians, who dived for the shells without having apparatus or modern appliances for diving. The Government has granted an English company a concession which is practically a monopoly of the pearl fishing in the Gulf of California. This company has provided its divers with all the modern appliances, thus enabling them to reach greater depths than were possible under the old system.

In 1896 the value of the pearls collected in Lower California was only \$300. Besides this, however, there were exported 5,000 tons of pearl shell, valued at \$1,250,000. The headquarters of the natives engaged in this industry is La Paz, a small town of 2,000 inhabitants and one of the capitals of the territory named. The business is, of course, one depending considerably upon chance, but the natives are very fond of it. The large majority of the shells contain no pearl and are what is known as seed pearls. The largest pearl ever found in the waters of the gulf was about three-fourths of an inch in diameter and was sold in Paris to the Emperor of Austria for the sum of \$10,000. A number of black pearls have been found in these waters, and they bring very high prices.

Sponges, mother-of-pearl, abalone, and other shells are found here and constitute, together with tortoise fishing, a considerable industry. The Government has been anxious for some years to develop these

marine branches of industry and production, and will make liberal concessions to companies desirous of engaging in them. In comparison to the returns, the capital necessary to exploit them is small.

The exportations of pearl shell for the year 1896-97 were 80,254 kilograms, valued at \$15,447.

There are a number of cotton-seed oil mills in the Republic, the largest being located at Lerdo, Durango. Considerable American capital is invested in the enterprise. The mill was established in 1887, and has a capital of \$1,000,000. Its capacity is 100 tons a day. The meal is shipped all over México and to Rotterdam and Hamburg. The oil is used in the manufacture of soap, which is another considerable industry. This company has since 1892 sold between 10,000,000 and 11,000,000 pounds of soap a year.

Another noteworthy industry is the collecting and exporting of hides and skins. México occupies the fourth rank among the nations of the earth in this particular branch.

In the year 1898-99 that country exported hides, skins, and leather to the value of \$3,646,915, Mexican silver (a gain of \$56,438 over the previous fiscal year), as follows:

Hides	\$1, 289, 538
Tanned leather.....	47, 084
Sheepskins.....	313
Goatskins.....	2, 069, 549
Deerskins.....	106, 297
Boar skins.....	5, 435
Alligator skins	118, 414
Other skins	10, 285

The kid exported through the Matamoros custom-house is much esteemed for the manufacture of strong shoes, its dimensions and weight ranking high. This kid brings from 45 to 50 cents per pound. The Veracruz goatskins are more sought after and bring 2 cents more a pound, while those from Oaxaca are lighter and bring about 39 cents per pound. These kids are considered among the best in the world for women's and children's shoes.

Another industry, although not a prominent one, is the killing of seals and sea lions on the coast of Lower California, the skins being converted into leather.

Tanneries are to be found at many places, and a very fair leather is turned out. Mexicans are artists in leather work, and in the making of saddles they excel. Saddles manufactured in the country have sold for more than \$800, being profusely ornamented with silver and finely stamped leather. The center of the leather-working industry is the city of León.

Glassware is manufactured to some extent, but not to that warranted by the abundance of the raw material suitable to glass making. The industry is almost limited to the making of window panes and ordinary

bottles and goblets, at prices so high that the poor are almost denied their use.

There are but few manufactories of jewelry and trinkets in the country, notwithstanding the Mexican love of display in this line. The importations of jewelry and trinkets is made from France, England, and the United States. The silver and gold smiths of the country excel in the execution of filigree work, it being sought after in all parts of the civilized world.

The manufacture of acids and chemical compounds, which would undoubtedly be a profitable industry, has about thirteen establishments devoted to it, and of these not more than five manufacture acids—so necessary to the mining industry. Sulphuric, hydrochloric, and nitric acids are manufactured at great profits.

Another quite prominent industry is the manufacture of chocolate, several large factories being devoted to the converting of the cocoa bean into this article. The Mexican chocolate when ground with cinnamon is highly valued.

Hardware is also manufactured, there being in the City of México and other large centers a number of foundries where are manufactured a considerable amount of iron and galvanized-iron balconies, girders, columns, and other building material.

Felt hats are made in all the large cities, and straw hats everywhere.

The manufacture of wooden and wax matches is extensively carried on in the country, there being several match factories in the City of México and a large number in Puebla.

A large business is done, although nowhere upon an extensive scale, in the manufacture of *dulces* (sweetmeats) and confections. This business presents a good opening for enterprise. Imported American candies sell in México City for \$1.65 per pound, silver.

Gunpowder is also manufactured to quite an extent. In 1897 the Department of Promotion entered into a contract with a capitalist who binds himself to establish one or two fulminate factories to manufacture the article for mines and smokeless powder for sporting and military purposes.

Among the distinctively Mexican industries are the beautiful drawn work¹ and feather work, in the making of which, as well as in the spinning of horsehair *riatas*, or lassos, which every Mexican *charro* carries on the pommel of his saddle, the natives of the country are unexcelled. Even the peon's wife has a piece of drawn work with which to cover her husband's dinner basket. Mexican lace is also far famed.

There are many brick, artificial stone, tile, lime, soap, varnish, paint,

¹In Silao, Guanajuato, a resident owns a beautiful tablecloth of drawn work and embroidery. It is pure linen, 13 feet long by 6½ wide. It took 30 Mexican women three years to complete it, and cost \$10,000. It will be exhibited at the Paris Exposition in 1900.

starch, musical instrument, harness, blank-book, and other manufactories.

Despite the fact that México is a large producer of cabinet woods, the manufacture of furniture is but little developed. The rich and well-to-do classes import nearly if not all of their furniture, upon which heavy duties are levied, and the poorer classes need but little, and that of the most humble description.

Since the first edition of the Handbook of México was issued the country has made great strides in the industrial and manufacturing field. A progressive Government has done all in its power to foster home manufacture, and has offered great inducements to those who wish to establish upon Mexican soil enterprises which will utilize within its borders those articles which its fecund soil produces.

Many American manufacturing firms have within the past years established branch plants in the more northern States, and are meeting with marked success.

Rubber factories are springing up, electrical plants for the transmission of power are being installed, a syndicate of wealthy Spaniards is now erecting a large petroleum refinery near the City of México, and, not long ago, the governor of Nuevo León granted a concession to an American company to establish at Monterey a manufactory of perfumes, Florida water, vinegar, etc.; also a concession to erect a mill to grind corn and oats, to be equipped with American machinery.

At the close of the year 1897 the Government entered into two contracts for the establishment in the Republic of packing houses. This will provide a market for the large number of cattle exported to the United States for the consumption of American packing houses, and will give great impulse to the cattle-breeding industry.

Smelting and reduction works, waterworks, electric plants, etc., are springing up throughout the country, and the columns of the Government Official Gazette are daily filled with applications for patents, waste lands, water privileges, railroad franchises, etc., all of which indicate that an era of prosperity has dawned,

Among other industries to be established in the country, according to reports, are a condensed-milk factory with a minimum capital of \$150,000; oil and soap factories equipped with electric light and powerful machinery; a large factory in Yucatán to utilize benequén and similar fibers for the manufacture of cordage, hammocks, and bags, the plant being expected to produce 14,000,000 kilograms of fine thread, binding twine, cordage, bags, etc.; hat factories; electric light and power plants; a bicycle and typewriter factory, and one for iron safes, etc.

President Díaz, in his last message to Congress,¹ refers as follows to the industrial development of the country:

“The manufacturing industries also give evidence of noteworthy

¹September 16, 1899.

progress, the following plants, which have been erected under concessions from the Federal Government for the utilization of water power, being especially entitled to mention on account of their evident importance: The Industrial Company, of Veracruz, erected a dam on the Rio Blanco in order to utilize a volume of water which under a suitable elevation produces 1,500 horsepower, consumed in the spinning and weaving factory of Santa Rosa, inaugurated in May of the present year; the Industrial Company, of Orizaba, constructed another dam on the Tlilapam River with a race of 1,700 meters in length, conveying the water to four turbines connected with dynamos, developing 2,250 horsepower; the electrical energy thus generated is transmitted by means of overhead wires to the Rio Blanco cotton factory; the San Ildefonso Company has completed all its waterworks on the Monte Alto River, including an aggregate of 25 kilometers of races with dams, sluices, and other engineering works of importance; along the Tlalnepantla River 25 more kilometers of races are about to be completed; the ensemble of these works, with their respective electric plants, will produce an effective energy of 5,500 steam horsepower, which will be transmitted to the City of México. In the district of Atlixco, State of Puebla, another company has erected waterworks sufficient to produce 1,125 horsepower, to be utilized in a new spinning and weaving factory. Still another company has completed waterworks on the Cuautitlán River of sufficient importance to produce 810 horsepower. The development of the manufacturing interest is also proved by the increased value of the exportation of manufactured products, amounting in the last fiscal year to more than \$2,600,000, showing an increase of more than \$700,000 over the preceding year. A considerable increase is also observed in the importation of machinery, copper wire, iron, steel, and coal. A corporation has recently been organized in Europe, composed of firms of high standing in Paris, Berlin, and Geneva, to undertake industrial enterprises in the Republic."

The business movement in México for the year 1899, as shown by the Recorder of Public Instruments, is as follows:

January	\$7, 387, 398. 07
February	9, 742, 443. 52
March	9, 686, 092. 51
April	4, 799, 262. 61
May	6, 713, 275. 43
June	8, 224, 135. 71
July	4, 829, 384. 68
August	6, 296, 571. 45
September	15, 650, 549. 65
October	5, 267, 844. 08
November	8, 918, 626. 18
December	6, 857, 401. 60
Total	94, 372, 985. 49

Among the companies mentioned were: The Mexican Motive Power Company, incorporated with a capital of \$10,000,000; the United States Banking Company, incorporated with a capital of \$100,000; the Petroleum and Liquid Fuel Company, capital \$502,500; reorganization of the Veracruzana Industrial Company, capital \$1,735,000; sale of the dry goods establishment "El Puerto de Tampico," the amount involved being \$186,814.95; the incorporation of the Banco Central Mexicano, with a capital of \$6,000,000; the incorporation of the cigarette manufacturing company known as "El Buen Tono," with a capital of \$2,500,000, and the incorporation of the Parral-Durango Railroad Company, with a capital of \$1,000,000.

It may not be amiss to close this chapter with a statement of the various nationalities represented in México's business pursuits. The French control the dry goods business; the Germans are largely interested in the drug and liquor trade; the Spaniards supply the groceries; the Americans run the railroads and represent large United States firms, and the Italians are the coppersmiths.

CHAPTER XI.

COMMERCE.

The history of the commercial development of México is too long to be followed step by step. The natives of the Western Continent, even before its discovery and conquest, maintained a rudimentary commerce, and in México, among the Aztecs, such as were interested in international trade were highly honored, and were designated as *Pohtecas*. Instead of coins, copper pieces in T shape, grains or nuggets of gold, cacao nuts, etc., were used. True commerce, which necessarily entailed the use of metal coins, did not exist until the conquest, and it was not until the Spaniards found that gold and silver were becoming scarce that they thought of creating a trade between the new possessions and the mother country. As a consequence Spanish vessels loaded with merchandise began to arrive at the ports of Veracruz and Campeche, taking on their return trips immense cargoes of hides, indigo, tobacco, dyewoods, and other products. This trade increased with the foundation of the mint in México, which was the first to be established in the New World, but it was hampered to a great extent by the difficulties encountered between Spain and México, the English and French pirates who infested the ocean. The port of Acapulco was open to the products of the Philippine Islands, which were so valuable that it was claimed that each vessel freighted at Manila had on board merchandise worth 2,000,000 pesos. Trade then sprang up with China, Japan, and Perú, so that México, in the sixteenth century was the greatest commercial center of the then known world. During the seventeenth and eighteenth centuries domestic trade began to be developed, and foreign commerce fell off, owing to the constant wars between Spain and the various European States.

At the beginning of the nineteenth century the foreign trade of the Republic revived, reaching, it is claimed, the sum of 25,000,000 pesos for imports and over 16,000,000 for exports. Until about thirty years ago, however, the unsettled condition of the country was a serious impediment to this line of development; but peace being then established, railroads were constructed, bringing with them increased activity in commerce, industries and the arts; in short, of every branch of public prosperity and wealth.

The domestic trade of the country is made up of the interchange of natural products and the products of native industry for such as are

not indigenous to the country, or, if so, are produced on too small a scale to meet the requirements of native consumption; hence the necessity for importing such goods as are required to make up the balance of trade.

The principal exports of México are precious metals, henequén, coffee, cattle, etc., while the principal imports are machinery, cotton textiles, iron and steel, wines and liquors, wood and paper and manufactures thereof, and textile fibers.

Don Salvador Echegaray, director of the Bureau of Statistics of México, in a paper read before the International Commercial Congress in Philadelphia, October, 1899, made in substance the following statement in regard to Mexican trade development:

During the last twenty-five years the Republic of México, under President Diaz's Government, has enjoyed peace; the construction of 10,000 miles of railroads, the improvement of some of the ports, the general development of the country, and increase of public wealth have been made possible.

Imports which in the fiscal year of 1874-75 did not reach 19,000,000 Mexican dollars, in the last fiscal year (1898-99) amounted to 106,285,307 dollars, silver, an increase of nearly 600 per cent. Exports in 1875 were 27,318,788 in Mexican dollars, and in the last year 138,478,137 Mexican dollars, an increase of 500 per cent. In order of importance the principal articles imported into México are as follows:¹

Machinery.....	\$16, 775, 562	Wood textiles.....	\$3, 877, 971
Cotton textiles	12, 292, 190	Paper and manufactures....	3, 841, 244
Iron and steel.....	11, 920, 291	Textile fibers.....	2, 541, 878
Wines and liquors.....	5, 590, 984		

The most important products exported from México were in the last fiscal year:

Silver	\$66, 431, 541	Lead	\$3, 786, 144
Henequén	18, 711, 325	Copper	4, 135, 613
Gold	8, 843, 081	Hides	3, 646, 915
Coffee	7, 936, 908	Precious wood	1, 896, 908
Cattle	4, 918, 572	Broom root	1, 055, 669

The foreign commerce of México in the last seven fiscal years has been as follows:

Year.	Importation (declared value in gold).			Exportation (declared value in silver).		
	From United States.	From other countries.	Total.	To United States.	To other countries.	Total.
1892-93	\$26, 235, 963	\$17, 177, 168	\$43, 413, 131	\$63, 791, 741	\$23, 717, 466	\$87, 509, 207
1893-94	14, 351, 785	15, 935, 704	30, 287, 489	60, 660, 243	18, 683, 044	79, 343, 287
1894-95	15, 130, 367	18, 870, 073	34, 000, 440	67, 322, 986	23, 531, 967	90, 854, 953
1895-96	20, 145, 763	22, 108, 175	42, 253, 938	79, 651, 695	25, 365, 207	105, 016, 902
1896-97	22, 593, 869	19, 610, 235	42, 204, 095	86, 742, 951	24, 603, 543	111, 346, 494
1897-98	21, 490, 604	22, 112, 888	43, 603, 492	94, 974, 616	33, 998, 133	128, 972, 749
1898-99	24, 164, 687	26, 704, 507	50, 869, 194	103, 553, 486	34, 924, 651	138, 478, 137
Total...	144, 113, 029	142, 518, 750	286, 631, 779	556, 697, 718	184, 824, 011	741, 521, 729

¹Silver valuation.

This table, embracing a period of seven years, shows that the Republic is growing very rapidly as an exporting country, and very slowly as an importing one, due to competition between the Mexican and the foreign industries.

Foreign commerce for the fiscal year 1898-99 can be divided by countries in the following manner:

Countries.	Importation (declared value in American gold).	Exportation (declared value in Mexican dollars).
Germany	\$5,677,925	\$4,020,307
Spain	2,969,936	1,172,948
France	5,929,292	6,252,293
England	9,592,797	14,100,928
Italy	380,889	34,952
Belgium	707,408	2,577,688
United States	24,164,687	103,553,486
Cuba	24,205	5,257,884
Other countries	1,431,055	1,507,651
Total	50,869,194	138,478,137

The importation of American merchandise during the fiscal year of 1898-99 was as follows:¹

Animal industry	\$1,619,706
Agricultural products	5,054,116
Metals and their manufactures	7,335,447
Fabrics	1,131,230
Chemical products, drugs, oils, and paints	846,653
Wines, liquors, fermented and unfermented drinks	272,246
Paper and its manufactures	521,689
Machinery and apparatus	4,826,291
Carriages	934,590
Arms and explosives	961,295
Sundries	661,424
Total	24,164,687

Referring to the general condition of trade, the same authority stated that the greater demands for cotton goods in México, due to the increase of public welfare and population, produces scarcely any effect in the increase of imports of foreign cottons, because the new demand has been supplied by the native factories, of which there are a large number equipped with every modern improvement. Foreign beer has practically disappeared from Mexican markets, its place being filled by excellent domestic beer. The importation of white paper is also likely to disappear within a short time.

The low price of silver has produced an entirely different effect on the silver production in México than it did in the United States. When the price of this metal reached a certain point in that country several mines had to be closed, while in México veins were daily opened, the

¹Goods classified according to Mexican custom-house tariff, declared value in American dollars.

cost of production remaining almost the same, its extraction, labor, and transportation being paid as formerly. In the price of some imported goods, such as iron, steel, dynamite, coal, and engines, México must pay a larger amount than formerly. While this reduces the miner's earnings a little, it constitutes, however, an incentive for the increase of production.

México, which in years past occupied the second place as a silver producer, ranking next to the United States, took the first place in the year 1897-98, and if she is again in the second place it is only by a very small margin, a little over \$1,000,000. The exports of other metals and agricultural products is strongly protected by the high rate of exchange, which makes mining and husbandry productive in places where the great distance from the ports would otherwise prevent their being developed with profit. As a gold producer México retains the fourth place, the fifth as a lead producer, and the sixth as a producer of copper. Within four years the exports of the latter metal, of which México has extensive mines, is expected to be doubled.

México's industrial awakening can not be credited solely to the depreciation of silver. The construction of railroad lines and the introduction of foreign capital, attracted by the facilities granted by the Government, are factors which have contributed to the flourishing conditions of the country. The profitable exportation of some products increases their prices for home consumption, but staple products, such as corn and beans, have suffered no alteration.

The exports of merchandise from the United States to México, which in 1888 were about \$10,000,000, were in the fiscal year 1898-99 about \$24,000,000, an increase of 140 per cent. México buys from the United States more than Italy, Russia, or Spain, more than China or Japan, and more than every other country in America, with the exception of Canada. As a consumer of American goods México comes next only to six other countries. After the United States, England, Germany, and France hold important places in the Mexican commerce, the first with its cotton goods and its iron, the second with its hardware and iron goods, and the third with its clothes, silks, carpets, and manufactures of hosiery. There are in México a great number of Germans in the hardware trade, Frenchmen in the clothing, and Spaniards in groceries. Americans have hardly begun to establish retail commercial houses, and they prefer to establish agencies, buying their goods from the United States.

"American trade in Mexico," the same authority continues, "is inferior to the European, in that the American merchants want to do business exclusively on a cash basis, while the Europeans are willing to grant five or more months for payment. The custom, already firmly established by long practice among the large Mexican merchants, is to buy at long terms abroad and to sell in the same manner to the tradesman.

Banking accommodations, which the country now begins to enjoy, perhaps will make easy the adoption of the American system; but such a change is by no means certain, as a long habit of many years is opposed to it. I have noted recently that one of the United States consuls in Russia has recommended the adoption by that Empire of the same policy which I advise as convenient for the North Americans. To the present American system is undoubtedly due the fact that the trade in American goods has not had in México the rapid development which might have been expected on account of the proximity of the countries.

"The report of the American consul-general for the year 1899 says: 'As the terms of our American merchants are often very rigid, it is hard to reach an agreement, and much trade which by the exercise of a little tact and judgment could be handled by American merchants goes elsewhere.' Mexican merchants are noted for their integrity. The quoted report about commerce and industries in México says: 'There are very few concerns here doing business that have not ample capital to carry out all contracts into which they may enter. Failures are very rare, indeed, and when they do occur are carefully investigated by the authorities in the interest of creditors, and any attempts to defraud are severely punished. Book entries are regarded as sacred. All books kept by business houses are known and small stamp taxes paid on them, and thus a sort of surveillance is kept over them by the Government authorities.'

"The American business man can find at the very doors of his country an extensive territory for the employment of his capital. Enterprises for the building of irrigation works, the execution of municipal works that the Mexican cities are desirous of carrying into effect (chiefly in matters of water supply and the establishment of sewerage systems), demand capital. For the establishment of small industries, such as manufactories of soap of all kinds, oils, furniture, doors, etc., there are also opportunities all over México. The cities of México and Guadalajara will very soon have electrical power for sale. For establishments on a large scale it will be easy to utilize the waterfalls, chiefly in the regions forming the descent of the central plateau to the Atlantic and the Pacific.

"The growing prosperity of foreign commerce gives the measure of the progress of the country, but what confirms even more the optimistic opinions about the future of México is the figures showing the constant increase in the public revenue, due only to a greater return from the productive sources and not to new or higher taxes."

The imports of México for the fiscal year 1898-99 amounted to \$50,869,194, gold, as already stated, showing an increase of \$7,265,702 over the figures for the preceding year. Imports from the United States for the period in reference amounted to \$24,164,687, gold, also

showing an increase of \$2,674,083, while the imports from other countries exceeded the values for 1897-98 by \$4,591,619. Exports of Mexican products in 1898-99 amounted to \$138,478,137, Mexican silver, or a gain of \$9,405,343, Mexican silver valuation, over the year before, the share of the United States being \$103,553,486 and of other countries \$34,924,615, or an increase of \$8,578,870 and \$926,482, respectively.

The figures below show that American trade is distancing all competition, thus proving the acceptability of United States wares to Mexican markets:

Country.	1898-99.		1897-98.	
	Imports. <i>a</i>	Exports. <i>b</i>	Imports. <i>a</i>	Exports. <i>b</i>
United States.....	\$24,164,687	\$103,553,486	\$21,490,604	\$94,974,616
England.....	9,592,797	14,100,928	8,105,696	14,775,638
France.....	5,929,292	6,252,293	5,435,698	5,320,016
Germany.....	5,677,925	4,020,307	4,781,821	6,995,733
Spain.....	2,969,936	1,172,948	2,039,132	1,231,342
Belgium.....	707,408	2,577,688	590,196	1,556,090
Italy.....	380,889	34,952	186,273	30,600
Cuba.....	24,205	5,257,884	1,130	2,152,544
All other countries (45).....	1,431,055	1,507,651	972,942	1,936,170

a Declared value in American gold.

b Declared value in Mexican silver.

The following figures, compiled from Mexican official sources,¹ show the exports and imports for the fiscal years from 1897 to 1899, also the increase or decrease during the period named:

Exports.

Year.	Precious metals.	Other articles.	Total.
1898-99.....	\$86,257,851	\$52,220,286	\$138,478,137
1897-98.....	75,042,332	53,930,417	128,972,749
Difference in 1898-99.....	11,215,519	— 1,710,131	9,505,388

The list of exports embraces 215 numbers, or classes, a resume of which, according to Mexican official figures, gives the following results for 1898-99:

Mineral products:

Precious metals and ores ²	\$76,195,657
Industrial metals and ores.....	9,489,648
Mineral fuel.....	509,262
Miscellaneous.....	63,262
	<hr/> \$86,257,851

¹ Boletín de Estadística Fiscal, 1898-99, No. 194, México, 1899.

² In the above table gold is estimated at \$675.417 per kilogram and silver at \$40.915, pursuant to the Mexican regulations in the premises of June 26, 1895.

The average value of the Mexican silver dollar in New York during the year 1898-99 was \$0.4750.

Vegetable products.....	\$40, 271, 661	
Animal products.....	9, 205, 128	
Manufactured products.....	2, 615, 768	
Miscellaneous.....	27, 729	
		\$52, 220, 286
		138, 478, 137
Increase due to difference in price of gold exported, estimated at \$675.417 per kilogram, and its commercial value.....		9, 975, 697
Total.....		148, 453, 834

Imports.

Year.	Free merchandise (gold).	Dutiable goods (gold).	Total (gold).
1898-99.....	\$7, 627, 766	\$43, 241, 428	\$50, 869, 194
1897-98.....	7, 645, 742	35, 957, 750	43, 603, 492
Difference, 1899.....	— 17, 976	7, 283, 678	7, 265, 702

The total difference, in Mexican pesos, is equivalent to \$10,346,151 in favor of 1898-99.

The list of imports embraces 72 classes free of duty and 849 dutiable, a resume of which for 1898-99 is as follows:¹

Animals and animal substances:

Live animals.....	\$407, 168	
Animal products, unmanufactured.....	765, 859	
Animal products, manufactured.....	1, 314, 840	
Animal products, miscellaneous.....	1, 063, 342	
		\$3, 551, 109

Vegetable substances:

Textile fibers.....	1, 210, 418	
Fruits and grains.....	1, 299, 226	
Vegetable products, raw.....	517, 815	
Vegetable products, manufactured.....	1, 222, 442	
Wood and manufactures of.....	2, 079, 610	
Miscellaneous.....	552, 700	
Furniture.....	364, 073	
		7, 246, 284

Mineral substances:

Gold, silver, and platinum.....	238, 653	
Copper.....	1, 035, 039	
Tin, lead, and zinc.....	205, 563	
Iron and steel.....	5, 676, 329	
Other metals.....	452, 181	
Stone and earth.....	3, 472, 086	
Crystal, glass, earthenware, and porcelain.....	1, 204, 562	
		12, 284, 413

¹The values of the imports have been calculated, reducing foreign money to Mexican pesos; that is, calculating the United States dollar at par, the pound sterling at \$5, the franc at 20 cents, and the mark at 25 cents.

Textiles and manufactures of:

Cotton	\$5, 853, 424	
Flax	597, 677	
Wool	1, 846, 653	
Silk	647, 474	
Silk mixed with other fibers	660, 666	
		\$9, 605, 894
Chemical and pharmaceutical products		2, 078, 405
Spiritous, fermented, and natural beverages		2, 662, 356
Paper and manufactures of		1, 829, 164
Machinery and apparatus		7, 988, 362
Vehicles		1, 069, 979
Arms and explosives		1, 231, 665
Miscellaneous		1, 321, 563
Grand total (in gold)		¹ 50, 869, 194

A comparative table of the export trade of México in 1898-99 and 1897-98 shows the following differences:

Products.	1898-99.	1897-98.	Difference.
Mineral	\$86, 257, 851	\$83, 392, 589	\$2, 865, 262
Vegetable	40, 371, 661	34, 743, 290	5, 628, 371
Animal	9, 205, 128	8, 889, 147	315, 981
Manufactured	2, 615, 768	1, 909, 761	706, 007
Miscellaneous	27, 729	37, 962	10, 233
Total (silver)	148, 453, 834	138, 068, 504	10, 385, 330

The increase shown in the total exports, compared with the former tables, is due to the difference between the commercial value of the gold exported and its export price, as before stated. This difference between 1898-99 and the previous year was \$879,942 in favor of 1898-99, or 9.67 per cent, while the total increase of the export trade for the same year, compared with 1897-98, was 7.25 per cent.

As regards imports, the difference was as follows:

	1898-99.	1897-98.	Difference.
Animal substances	\$3, 551, 109	\$2, 337, 444	\$1, 213, 665
Vegetable substances	7, 246, 284	6, 069, 229	1, 177, 055
Mineral substances	12, 284, 413	11, 394, 581	889, 832
Textiles, and manufactures of	9, 605, 894	8, 155, 367	1, 450, 527
Chemicals, etc.	2, 078, 405	1, 946, 456	131, 949
Spirituous liquors	2, 662, 356	2, 254, 184	408, 172
Paper and manufactures of	1, 829, 164	1, 361, 316	467, 848
Machinery, etc.	7, 988, 362	6, 270, 652	1, 717, 710
Carriages	1, 069, 979	1, 100, 373	30, 394
Arms, etc.	1, 231, 665	1, 618, 233	386, 568
Miscellaneous	1, 321, 563	1, 095, 657	225, 906
Total	50, 869, 194	43, 603, 492	7, 265, 702

These figures show an increase of 16.66 per cent for 1898-99.

Taking the principal items of export, as shown in the table for exports above given, it is found that the exports of silver were

¹ The imports through the mails are not included in this table.

\$40,429,954 for silver bullion, \$14,116,935 for Mexican silver coin, and \$9,854,850 for silver ore, or a total of \$64,401,739, being nearly one-third of the total for mineral exports. The exports of gold bullion amounted to \$7,347,760; copper and copper ores, \$5,600,834, and lead, \$3,786,144. The second largest export is raw heniquéen, \$18,711,325—almost two-thirds of the total export figures for vegetable substances—the other large exports under this head being coffee, \$7,936,908; leaf tobacco, \$2,515,606; cabinet woods (mahogany, cedar, ebony, etc.), \$1,896,973; vanilla, \$1,283,057; dyewoods, \$1,156,902; broom-corn root, \$1,055,669, and raw ixtle, \$865,966. The most important article under the head of “Animals and animal products” is beef cattle, to the amount of \$4,723,500—nearly one-half of the total exports under this classification. Goatskins and ox hides rank next, with valuations of \$2,069,549 and \$1,289,538, respectively. In manufactured products, the largest export was manufactured tobacco, including cigars, cigarettes, etc., \$894,700, or a trifle over one-third of the total under this classification. Other important exports are cotton-seed cake, \$369,327; flour, \$300,666; sisal (cordage, hammocks, bags, etc.), \$206,047, and reexported foreign goods to the value of \$360,040.

As regards imports, the leading among free articles were railroad material, \$1,701,743; coal, \$1,340,264; manufactures of wood (barrels, boxes, railway sleepers, telegraph and telephone posts, etc.), \$657,016; railway cars and coaches, \$538,854. Among the dutiable goods the largest imports were as shown in the following tables:

Animals and animal products:

Live stock (all kinds).....	\$391,624
Wool (raw)	403,364
Raw skins and hides.....	137,546
Canned meats, fish, butter, etc.....	466,890
Condensed milk.....	210,807
Cheese	125,122
Stearin	182,992
Furs and skins, and manufactures of.....	521,882
Boots and shoes.....	230,906
Manufactured animal products	310,193

Vegetable substances:

Ginned cotton.....	1,005,939
Other fibers.....	142,530
Cacao (all kinds).....	260,897
Dried fruits.....	262,013
Wheat and other cereals.....	262,013
Almonds (all kinds), shelled.....	112,418
Fresh fruits, etc.....	111,120
Virginia leaf tobacco.....	162,811
Olive oil.....	106,684
Cotton-seed oil (crude)	505,108
Lumber and timber	130,958

Vegetable substances—Continued.

Manufactures of wood.....	\$299, 568
Bags and bagging.....	330, 920
Furniture (all kinds).....	364, 073

Mineral substances:

Gold, silver, and platinum, and manufactures of.....	161, 674
Copper and alloys in bars and plates.....	110, 350
Copper and alloys, manufactures of.....	710, 053
Manufactures of tin, lead, and zinc.....	160, 116
Iron wire for fences.....	251, 935
Plows and plowshares.....	130, 300
Iron pipes (all sizes).....	472, 381
Agricultural implements.....	213, 390
Iron bands.....	135, 577
Iron sheets for roofing (all kinds).....	497, 148
Tin plates.....	126, 853
Iron girders and beams.....	242, 399
Manufactures of tin, galvanized iron, etc.....	227, 075
Manufactures of iron, enameled, etc.....	146, 051
Manufactures of iron, not specified.....	613, 611
Nails, tacks, screws, etc.....	276, 494
Lime, Portland cement, etc.....	240, 803
Mineral oils (crude).....	421, 677
Paraffin.....	260, 435
Miscellaneous, including tiles, bricks, etc.....	228, 870
Glass bottles.....	270, 699
China and earthen ware.....	290, 125
Crystal and glass ware, n. e. s.....	188, 183

Textiles and manufactures of:

Cotton thread, on spools.....	549, 486
Cotton thread in balls and skeins.....	224, 036
Lace of all kinds, and manufactures of, n. e. s.....	242, 540
Cottons, not more than 30 threads per square of 5 millimeters.....	956, 879
The same, over 30 threads.....	122, 762
Cotton prints, not exceeding 30 threads per square of 5 millimeters..	1, 355, 807
The same, exceeding 30 threads.....	124, 691
Cotton cloth, openwork or embroidered.....	1, 064, 402
Stockinet and manufactures of, n. e. s.....	362, 389
Cotton braids, trimmings, etc.....	122, 349
Elastic webbing.....	198, 103
Cotton edgings, insertions, etc., embroidered with cotton, linen, wool, or silk.....	132, 324
Cloth, linen, hemp, or other like fibers, white, drab, or colored, plain woven, over 12 threads per square of 5 millimeters.....	267, 646
Woolen cloths (all weavings and kinds).....	1, 242, 631
Silk fabrics (all weavings and kinds).....	268, 013
Articles and manufactures of silk, n. e. s.....	259, 783
Cloth of silk warp, and cotton, linen, or wool filling or vice versa...	240, 647
Articles of silk with mixture of cotton, linen, or wool, all kinds.....	223, 621

Chemical and pharmaceutical products:

Drugs and medicines of all kinds.....	466, 574
Colors, powdered, in crystals, or prepared.....	337, 340
Caustic soda and potash.....	184, 363
Sulphate of copper, iron, and ammonia.....	267, 235

Spirituuous, fermented and natural beverages:

Rum in glass.....	\$525, 884
Rum in casks.....	181, 735
Beer and cider in glass.....	112, 559
White and red wine in the wood.....	1, 256, 823
White and red wine in the glass.....	349, 958
Sparkling wines.....	107, 272

Paper and its manufactures:

Wrapping paper.....	178, 779
Cigarette paper.....	365, 402
Cardboard, manufactures of, n. e. s.....	102, 878
Printed books, bound.....	177, 932

Machinery and apparatus:

Pumps and turbines.....	247, 488
Hardware of all kinds for trades.....	376, 522
Musical instruments (all kinds).....	325, 506
Steam engines and parts of.....	2, 399, 851
Machinery and apparatus of all kinds, n. e. s., for power other than hand or foot.....	3, 437, 352
The same, for foot or hand power.....	656, 920
Printing and lithographic presses and accessories.....	115, 267

Vehicles:

Carts, wagons, and cars without springs, for freight.....	112, 463
Wheelbarrows, one or two wheels.....	115, 469
Bicycles, all kinds.....	96, 355

Arms and explosives:

Breech-loading firearms, of all kinds and accessories.....	183, 290
Loaded and empty shells for firearms.....	105, 400
Dynamite and other explosives.....	557, 523
Fuses and detonators for mining.....	104, 011

Miscellaneous:

Lubricating oils.....	109, 314
Manufactures of gutta-percha and celluloid, n. e. s.....	163, 811
Hats, all kinds, and accessories.....	149, 658
Rubber belts for machinery.....	69, 323
Rubber hose.....	50, 398
Iron, steel, and wood buildings.....	63, 163
Roofing materials.....	40, 054
Perfumery.....	174, 749

Under the general head "American commerce," the Monthly Summary of Commerce and Finance,¹ prepared by the Bureau of Statistics, Treasury Department, United States, reviewing the trade of the United States with México, says, in part, as follows:

"The exports of merchandise from the United States to México, which in 1888 were \$9,897,772, were in 1898 \$21,206,939, an increase of 114 per cent. During the same time the exports from the United Kingdom to México increased from \$6,683,432 in 1888 to \$8,427,989 in 1897, an increase of 26.12 per cent. The exports of France to México in 1888 were \$8,471,374, and in 1897 \$5,123,488, a loss of 39.39

¹ No. 12, series 1898-99.

per cent. Germany, who has been making rapid gains in her export trade to all American countries south of the United States, sold to México in 1888 goods valued at \$1,616,020, and in 1897 \$4,257,106, an increase of 8 per cent; while Spain, although speaking the same language, exported to México in 1888 goods valued at only \$1,344,885, and in 1896, the latest available figures, \$1,675,657. The most important of our exports to México are manufactures of iron and steel, machinery, unmanufactured cotton, lumber, manufactures of wood, manufactures of cotton, and gunpowder. Under the general classification of 'Manufactures of iron and steel' the exports increased rapidly between 1890 and 1898, as did also builders' hardware and machinery, as will be seen by an examination of the accompanying tables. Unmanufactured cotton exported to México in 1898 amounted to \$1,321,473 in value, against \$1,217,805 in 1890, showing a slight increase; cotton cloths show a slight reduction, the total for 1898 being \$415,910, against \$468,757 in 1890, this decrease being due to the rapid increase in the cotton-growing and manufacturing industries of México. In the finer grades of manufactures there is a marked increase. Furniture and all other articles included under the general head of manufactures of lumber increased from \$328,707 in 1890 to \$515,676 in 1898; gunpowder and other explosives from \$364,568 in 1890 to \$756,494 in 1898; steam engines from \$283,005 in 1890 to \$559,401 in 1898. The total for 1898 is slightly below that for 1897, owing to the unusual demand for corn from the United States in 1897, of which the exportations in that year amounted to \$3,233,281, against but \$43,557 in 1898, in which year the home supply of corn in México was equal to the demand.

"The imports of merchandise into the United States from México nearly equal our exports to that country, and in addition to this México sends us large quantities of her gold and silver in ore, for which we have better smelting and refining facilities than she possesses. The importations of precious metals into the United States from México in 1898 were: Gold, \$5,122,282; silver, \$25,028,888, including coin, base bullion, and ore, though the most of this was in the form of base bullion and ore. Of merchandise other than the precious metals, our total imports from México in 1898 were \$19,004,863, against \$21,206,939 of exports to México. The chief imports from México are coffee, hides, textile grasses (especially sisal), cattle, lead, copper, and tobacco. The importations of coffee have materially fallen during the last few years, the imports of coffee in 1898 being \$3,599,392, against \$5,094,839 in 1891.

"The importance of the trade of México naturally attracts the attention of the civilized world. With an area nearly equal to that of all of the United States lying east of the Mississippi River, possessed of a fertile soil and a semitropical climate, productive mines, and such supplies of natural water power as to give her valuable facilities for

manufacturing, the future commerce of that country is looked upon as likely to be of great value. The supply of minerals is very large, including gold, silver, lead, iron, copper, quicksilver, tin, cobalt, antimony, coal, and petroleum, and the latest record (1894) shows over 3,000 mining enterprises in actual operation in the country. Coffee, tobacco, hemp, sisal, sugar, dyewoods, and cabinet woods are the most important of her products for the export trade aside from the precious metals, which form a large portion of her exports. Of the exportations of 1897-98, which amounted to \$128,972,745 in Mexican dollars (or \$59,069,519 in United States currency), \$75,042,332 was precious metals and \$53,930,417 merchandise. Of the exportations, \$94,974,616 was sent to the United States, \$14,775,638 to Great Britain, \$6,995,733 to Germany, \$5,320,016 to France. The relative importance of the exports, aside from precious metals, were, henequén, \$11,588,572; coffee, \$10,649,119; cattle, \$4,507,327; tobacco, \$4,489,768; hides and skins, \$3,597,077; wood, \$3,597,069, all stated in Mexican dollars."

From the same source it appears that the trade between México and the United States during the fiscal years 1897-98 and 1898-99 was as follows:

	1898-99.	1897-98.	Difference.
Exports to México.....	\$25,480,281	\$21,206,939	\$4,273,342
Imports from México.....	22,994,091	19,004,863	3,989,228
Total	48,474,372	40,211,802	8,262,570

According to the same authority the principal imports made by the United States from México during the last two fiscal years named were as shown in the following table:

Articles.	1898-99.	1897-98.	Difference.
Logwood	\$22,853	\$21,922	\$931
Bituminous coal.....	234,884	200,728	— 34,156
Coffee.....	2,686,248	3,299,392	913,144
Henequén	8,902,213	5,104,228	3,797,985
Oranges	139,644	134,672	4,972
Hides and skins	1,879,750	1,698,574	181,176
Rubber	142,887	41,901	100,986
Lead (pig, bars)	1,908,111	1,601,458	306,653
Sugar	52,976	44,598	— 8,378
Tobacco, leaf	229,554	259,279	29,725
Mahogany	413,222	309,493	103,729

Exports of American merchandise to the same country during the period under comparison were as follows:

Articles.	1898-99.	1897-98.	Difference.
Agricultural implements.....	\$224,476	\$124,368	\$98,108
Cattle.....	98,920	78,400	20,520
Hogs.....	87,642	44,487	43,155
Horses.....	81,849	77,090	4,759
Sheep.....	11,525	9,748	1,777
Books, maps, engravings, etc.....	57,819	125,006	- 67,187
Corn.....	63,412	43,557	19,855
Wheat flour.....	138,979	86,848	52,131
Wheat.....	5,145	41	5,104
Carriages, etc.....	510,247	508,678	1,569
Cycles and parts.....	48,301	68,022	- 19,721
Clocks and watches.....	28,008	20,128	7,920
Coal.....	1,235,256	974,040	261,216
Copper.....	38,800	22,583	16,217
Cotton, unmanufactured.....	1,043,473	1,321,473	-278,000
Cotton cloths.....	481,569	415,910	65,659
Wearing apparel.....	401,962	334,615	67,347
Fruits and nuts.....	75,920	58,513	17,407
Hides and skins.....	2,606	2,676	- 70
Electric and scientific apparatus.....	427,041	287,270	139,771
Steel rails.....	587,589	561,151	26,438
Hardware.....	358,213	461,532	-103,319
Sewing machines.....	270,592	197,692	72,900
Typewriting machines.....	45,824	28,975	16,849
Leather (not sole).....	9,872	9,310	562
Boots and shoes.....	212,245	87,669	124,576
Rosin, tar, etc.....	8,924	10,212	- 1,288
Turpentine.....	4,393	3,629	764
Mineral oil, crude.....	395,386	317,514	77,872
Mineral oil, refined.....	191,480	184,088	7,392
Oils, vegetable.....	491,114	328,768	162,346
Paraffin.....	241,110	157,863	83,247
Canned beef.....	19,570	14,237	5,333
Beef, salted or pickled.....	625	492	133
Tallow.....	33,575	24,364	9,211
Bacon.....	17,277	9,804	7,473
Hams.....	30,956	23,790	7,166
Lard.....	169,689	177,525	- 7,836
Oleo and oleomargarine.....	731	961	- 230
Butter.....	49,767	43,720	6,047
Cheese.....	4,928	3,984	944
Seeds.....	15,724	29,472	13,748
Sugar, refined.....	50,104	18,722	31,382
Tobacco, unmanufactured.....	135,636	143,786	- 8,150
Tobacco, manufactured.....	20,329	25,914	- 5,585
Wood, unmanufactured.....	257,918	296,589	- 38,671
Lumber.....	843,300	797,500	45,800
Furniture.....	241,771	157,095	84,676

The only available figures and data in reference to Mexican commerce with other countries in 1898-99 are those of the official publications of Great Britain, which show, for the first six months of the year 1899, an increase over the same period in 1898. While undoubtedly there were many Mexican products exported to the British markets, they do not figure in the report named, except, perhaps, under general headings. The articles purchased by México include the following items, the value of the purchases in 1898 being also given for the sake of comparison: Cotton manufactures—unbleached piece goods, £1,564 in 1899 and £1,255 in 1898; bleached piece goods, £89,802 in 1899 and £85,612 in 1898; printed piece goods, £74,442 in 1899 and £55,174 in 1898; dyed piece goods, £52,974 in 1899 and £38,501 in 1898; total value of cotton piece goods, £218,782 (\$1,064,593.21) in 1899 and £180,542 (\$878,517.37) in 1898. The value

of the linen piece goods shipped in 1899 was £19,829 (\$96,487.71) and £19,102 (\$92,950.33) in 1898.

A resume of the entire foreign trade of México in 1898-99 shows that the imports from the principal European countries as compared with the previous year stood as follows: Germany, a gain of \$896,104; Spain, \$930,804; France, \$481,469; Great Britain, \$1,105,525; Belgium, \$117,212; Austria, \$195,074; India, \$182,891; Italy, \$194,616, and Switzerland, \$176,107. The trade with Asia was almost wholly with China and Japan, and over three-fourths of that with Africa was with Egypt.

With regard to America, the imports were nearly all from the United States, as already shown, the other countries being represented as follows:

Country.	1899.	1898.	Difference.
Argentine Republic.....	\$126	\$90	\$36
Bolivia.....	96	.....	96
Brazil.....	5,621	8,658	- 3,037
Colombia.....	48,764	24,127	24,637
Cuba.....	24,205	1,130	23,075
Chile.....	3,787	867	2,920
Ecuador.....	87,315	73,681	13,634
Guatemala.....	21,888	14,950	6,438
Honduras.....	4,803	.....	4,803
Paraguay.....	12	.....	12
Perú.....	9,834	311	9,526
Salvador.....	813	3,648	- 2,835
Santo Domingo.....	145	38	107
Uruguay.....	341	52	289
Venezuela.....	57,391	36,963	20,428

The great bulk of the imports were received at the Gulf and northern customs districts. In the official report whence these data are taken the receipts of merchandise for each port are given, but for convenience they are grouped into four sections or classes, namely:

Section.	1899.	1898.	Difference.
Northern frontier.....	\$14,723,236	\$12,822,165	\$1,901,071
Southern frontier.....	162,918	233,002	-70,084
Gulf of México.....	32,697,849	27,290,731	5,407,118
Pacific Ocean.....	3,285,191	3,257,594	27,597

There were no exports in 1899 to either Asia or Africa, but in 1898 merchandise to the value of \$4,312 was sent to Asia. The exports to Europe amounted to \$28,718,088 in 1899, against \$30,905,831 in 1898, a decrease of \$2,187,743. To America the figures for 1899—\$109,760,049—show a gain of \$11,697,443. Almost all of this gain was due to the purchases of the United States and Cuba.

The principal European countries receiving Mexican products in both years and the amounts for each year were:

Country.	1899.	1898.	Difference.
Great Britain.....	\$14,095,178	\$14,775,638	— \$680,460
Germany.....	4,020,307	6,995,733	— 2,975,426
France.....	6,252,293	5,320,016	932,277
Belgium.....	2,577,688	1,556,090	1,021,598
Spain.....	1,172,948	1,231,342	— 58,394
Holland.....	477,709	719,322	— 241,613
Russia.....	53,199	270,370	— 217,171
Italy.....	34,952	30,600	4,352
Austria.....	25,838	.....	25,838

The American countries taking Mexican products were:

Country.	1899.	1898.	Difference.
United States.....	\$103,553,486	\$94,974,616	\$8,578,870
Porto Rico.....	3,000	.....	3,000
Cuba.....	5,257,884	2,152,544	3,105,340
Brazil.....	245	.....	245
Chile.....	.....	603	— 603
Colombia.....	64,977	2,260	62,717
Costa Rica.....	3,354	505	2,849
Ecuador.....	366	342	24
Guatemala.....	483,375	846,016	— 362,641
Honduras.....	195,299	5,250	190,049
Nicaragua.....	702	390	312
Perú.....	967	7,999	— 7,032
Salvador.....	61,024	21,191	39,833
Santo Domingo.....	124,170	50,720	73,450
Venezuela.....	11,200	170	11,030

With reference to customs districts, the merchandise exported was from the following sections:

Section.	1899.	1898.	Difference.
Northern frontier.....	\$33,241,788	\$35,183,281	\$1,941,493
Southern frontier.....	1,521,692	1,948,300	— 426,608
Gulf of México.....	92,637,414	80,785,690	11,851,724
Pacific Ocean.....	11,077,243	11,055,478	21,765

For the first six months of the fiscal year 1899–1900 the total trade of México was as follows:¹

Imports (gold).....	\$28,003,742
Exports (silver).....	70,806,959

The valuation of the imports in silver as given by the Bureau of Statistics of México is equivalent to \$58,934,254, thus making a difference of \$11,872,705 in favor of the exports.

Imports during the six months in reference show a gain of \$10,505,434, silver, over those of the same period in 1898–99, while the exports indicate a decrease of \$6,009,434. The increase for imports

¹ Boletín No. 13.—Sección de Estadística-Secretaría de Hacienda y Crédito Público—México, January, 1900.

ranges from \$80,000 for liquors up to \$1,058,227 for machinery and apparatus and \$1,767,561 for mineral substances.

The decrease in exports for the periods under comparison, calculated upon the difference between the export price of gold (\$675.416 per kilogram) and its commercial value, is represented as follows:

Products.	July to December.		
	1899.	1898.	Difference.
Mineral	\$40,293,696	\$48,502,072	—\$8,208,376
Vegetable	19,775,244	17,650,061	2,125,183
Animal	5,700,500	4,232,273	1,468,227
Manufactured	854,656	1,301,736	— 447,080
Miscellaneous	325,355	9,958	315,397
Total	66,949,451	71,696,100	— 4,746,649

The imports by countries were as follows:

Country.	July to December.		
	1899.	1898.	Difference.
Europe	\$13,877,205	\$11,855,710	\$2,021,495
Asia	60,353	57,528	2,825
Africa	12,335	3,525	11,810
America	14,050,849	10,684,596	3,366,253
Total	28,003,742	22,601,359	5,402,383

In the total gain for Europe, France (exclusive of her colonies) was represented by \$552,936; Germany, \$435,994, and England by \$594,006, while in the \$3,366,253 for America, the share of the United States was \$3,345,517, leaving a balance of \$20,736 for the 17 other Latin-American countries, of which Cuba's quota was \$13,000.

The exports, by countries, for the periods under review were as follows:

Country.	1899.	1898.	Difference.
Europe	\$10,942,532	\$17,466,527	—\$6,523,995
Asia	2,000	.....	2,000
Africa .....	.....	.....	.....
America	56,004,919	54,229,573	1,775,346
Total	66,949,451	71,696,100	— 4,746,649

In this division of exports Germany's decrease is represented by \$569,336; France, \$657,959, and England, \$5,002,107, while out of a total increase for Latin America of \$1,775,346 the share of the United States is represented by \$1,227,901, leaving a balance of \$547,445 for the other countries of the continent.

The imports by customs districts during the same periods amounted to \$28,003,742 in 1899, against \$22,601,359 in 1898, or a net gain of \$5,402,383, while exports through the same channels were \$66,949,451 for 1899 and \$71,696,100 for 1898, a net loss of \$4,746,649.

The ports of México open to foreign commerce are divided into Gulf and Pacific ports, as follows:

Gulf ports.—Alvarado, Campeche, Coatzacoalcos, Chetumal, Frontera, Isla del Carmen, Isla de Mujeres, Progreso, Tampico, Tuxpam, Tlacotalpam, and Veracruz.

Pacific ports.—Acapulco, Altata, Guaymas, La Paz, Manzanillo, Mazatlán, San Blas, Santa Rosalia, Soconusco, and Todos Santos.

The ports through which the coast trade is carried on on the Gulf side are Alvarado, Campeche, Celestún, Coatzacoalcos, Champotón, Chetumal, Frontera, Isla Aguada, Isla del Carmen, Isla de Mujeres, Nautla, Palizada, Progreso, Tampico, Tecolutla, Tlacotalpam, Tuxpam, and Veracruz; and on the Pacific side, Acapulco, Agiabampo, Altata, Bahía de la Magdalena, Guaymas, Isla del Carmen, Isla Madre, La Paz, Manzanillo, Mazatlán, Mulejé, Perihuate, Puerto Angel, Salina Cruz, San Blas, San José del Cabo, San Quintin, Teconapa, Todos Santos, Santa Rosalia, Santo Domingo, Soconusco, Tonalá, Topolobampo, and Zihuatanejo.

The frontier custom-houses are Ciudad Juarez, Ciudad Porfirio Diaz, Laredo, and Nogales.

The domestic trade of the Republic is carried on mainly by means of the railways and coastwise vessels, while the foreign trade with the United States is maintained by railroads and ocean steamers, and with the other nations of the world by steam and sailing vessels.

The "Boletín de Estadística Fiscal" for 1898-99 estimates the foreign trade movement as follows:

The number of incoming vessels direct from abroad, at the 12 Gulf ports and the 10 Pacific ports, was 777 steamers with a cargo of 495,976 metric tons of 1,000 kilograms, and 725 sailing vessels with a cargo of 194,951 metric tons, or a total of 1,502 vessels with a total cargo of 690,927 metric tons, divided as follows: Gulf ports, 588 steamers and 602 sailing vessels; and Pacific ports, 189 steamers and 123 sail; or 1,190 vessels for the Gulf and 312 for the Pacific ports, under the flags of the following nationalities: German, 130; American, 383; English, 591; Norwegian, 208; French, 20; Spanish, 59; Honduran, 39; Mexican, 38; Russian, 12; Brazilian and Argentine, 1 each; Austrian, 5; Danish, 7; Hawaiian, 3; Dutch, 2; Swedish, 3; sailing from the following countries: United States, 642; England, 231; Honduras, 218; Germany, 69; Belgium, 16; Brazil, 41; Colombia, 60; Cuba, 86; Spain, 63; France, 40, and the remainder from other countries.

The outgoing foreign direct trade was carried in 1,401 vessels with a total cargo of 273,029 metric tons, the Gulf ports being credited with 1,109 vessels, the cargo of which amounted to 258,404 metric tons, and the Pacific ports with 292 vessels and a total cargo of 14,625 metric tons. The nationalities of the vessels were as follows: English, 347;

American, 178; Norwegian, 160; German, 100; French, 14; Spanish, 37, and Honduran, 38; their destination being: 682 to the United States, 209 to England, 194 to Honduras, 45 to Colombia, 38 to Spain, 42 to Germany, 121 to Cuba, 25 to France, and 17 to Chile, and others going to Belgium, Costa Rica, Guatemala, Haiti, Hawaii, Holland, Italy, Russia, and Santo Domingo.

The indirect foreign trade was as follows, 869 incoming vessels with 217,647 metric tons of merchandise, and 691 outgoing with 98,064 metric tons, of which 511 were from the United States and 404 to that country, 118 from and 107 to Colombia, 56 from and 42 to Germany, 95 from and 94 to England, 6 from and 5 to France, 18 from and 10 to Italy, 16 from and 3 to Belgium.

Internal trade was represented by 6,749 incoming vessels with a total cargo of 206,365 metric tons, and 6,793 outgoing vessels with 177,197 metric tons cargo. This trade was carried on through 18 Gulf and 26 Pacific ports, the incoming vessels engaged comprising 6,042 Mexican, 467 American, and 128 English, while the outgoing vessels comprised 6,051 Mexican, 479 American, and 141 English.

The total navigation for 1898-99 was as follows:

	Steamers.		Sail vessels.	
	Number.	Tonnage.	Number.	Tonnage.
Incoming.....	4,857	851,926	4,263	263,013
Outgoing.....	4,670	419,397	4,215	128,893
Total.....	9,527	1,271,323	8,478	391,906

The total tonnage was:

	Steamers.	Sail vessels.	Total.
Imports.....	703,816	204,758	908,574
Exports.....	299,176	71,917	371,093
Coastwise.....	268,331	115,231	383,562
Total.....	1,271,323	391,906	1,663,229

A resume of the freight carried on the railways of the northern frontier, in the trade between México and the United States, shows the following:

Frontier custom-houses.	Imports.		Exports.		Total.	
	Number of cars.	Tons.	Number of cars.	Tons.	Number of cars.	Tons.
Ciudad Juarez.....	10,612	181,036	6,333	108,740	16,945	289,776
Porfirio Díaz.....	7,000	90,123	5,878	140,320	12,878	230,443
Laredo.....	13,133	179,244	1,547	16,535	14,680	195,779
Nogales.....	1,560	17,436	1,748	22,817	3,308	40,253
Total.....	32,305	467,839	15,506	288,412	47,811	756,251

According to these figures, a total tonnage of 2,035,918 metric tons is indicated, of which 1,376,413 tons represent the imports and 659,505 tons the exports.

The total navigation for 1897-98 and 1896-97 was as follows:¹

Year.	Imports.		Exports.		Total tonnage.
	Vessels.	Tons.	Vessels.	Tons.	
1897-98.....	10,527	4,085,200	10,452	3,880,640	7,975,840
1896-97.....	10,078	3,972,941	10,162	3,889,955	7,862,896

The total railway transportation of merchandise for the same period was as follows:

Year.	Imports.		Exports.		Total tonnage.
	Cars.	Tons.	Cars.	Tons.	
1897-98.....	24,279	382,299	16,966	315,487	697,786
1896-97.....	31,044	578,934	17,119	349,164	928,098

These figures show a total tonnage for 1897-98 of 8,673,626 tons, indicating a difference of 117,368 tons in favor of 1896-97.

The custom-house receipts growing out of the traffic above indicated were as follows:

	1898-99.	1897-98.	Difference.
Imports	\$26,443,847.66	\$20,963,442.63	\$5,480,405.03
Exports	1,065,998.78	1,414,938.50	-348,939.72
Other customs dues	953,943.03	644,237.09	309,705.94
Total	28,463,789.47	23,022,618.22	5,441,175.25

These figures show an increase for 1898-99 of 23.63 per cent.

According to official data the Mexican merchant marine consists of 266 vessels, with a united tonnage of 17,046. Of these vessels, 41 are steamers, representing 10,314 tons, and 225 are sailing vessels, with 6,732 tons, measurement capacity.

The tariff law now in force in México was promulgated on June 12, 1891, and went into effect on November 1, following, several amendments having since been made. A synopsis of the general regulations of the tariff law of the Mexican United States (Tarifa de la Ordenanza General de Aduanas de los Estados Unidos Mexicanos), in so far as it treats of the obligations of shippers, passengers, etc., is given below.² The import tariff contains 921 different articles, divided into 11 general heads, these again being subdivided into 73 classes. The latest modi-

¹ Estadística Fiscal No. 174, México, 1898.

² The Bureau of the American Republics will furnish any further information in this regard upon application.

fications and amplifications were published in February, 1899, by the Bureau of American Republics.

Accompanying these modifications are a number of explanatory notes, the purpose of which is to fix more exactly the character of the merchandise coming under the several classifications.

The note in regard to the importation of all kinds of fine stock for breeding purposes is of interest, in view of the fact that the new tariff on the subject may give rise to a very considerable trade in the bringing in of pedigreed animals. The note in question is as follows:

“The free importation of thoroughbred animals included in this section and intended for breeding purposes may be granted when they come with their pedigree or certificate showing the purity of their breed; but the opinion of the Department of Promotion shall previously be heard with respect to the standing of the breed of which specimens are to be imported, the authenticity of the pedigree, and the reliance to be placed in the persons signing the same. In view of these particulars and others that the Department of Finance may consider proper to gather to the same end, and for the purpose of ascertaining the use which is to be made of the animals whose free importation is desired, the privilege of free importation may be granted, specifying the number of animals included in the privilege and requiring whatever guaranty may be deemed necessary, which shall be forfeited in case the animals are applied to any other use than that declared, or in case the pedigree, even after being accepted, should turn out to be false, without prejudice to applying in such cases the penalties provided by the customs regulations for smuggling.”

The following are the principal regulations governing the shipping of merchandise:

I. Shippers of goods to Mexican ports must supply an invoice of the goods shipped, even when such goods are for the public service of the Nation or the States, owing to a special concession, or are free from import duties. Separate invoices, in triplicate or quadruplicate, as the law may require, must be made out for each consignee.

II. Shippers of goods may include in one package several bales, boxes, mats, rolls, or any other container inclosing goods of a like nature, provided the consular invoice expresses the number of packages contained in each outer covering, bale, or box. Should this not be done, or the failure not corrected within ninety-six hours after the entry of the vessel at the receiving custom-house, a fine not exceeding \$50 will be imposed.

From this rule are excepted:

First. Heavy goods, which are usually tied together, such as iron and steel bars, pipes, metal sheets, boards for packing boxes and roofs, buckets and pails of wood or metal, parts of machinery, all similar goods, and free articles.

Second. Cans or immediate wrappings or containers of goods packed in each package.

Third. Piece goods in bales or cases; bottles, jars, or flasks containing elementary substances, drugs, perfumery, etc.; and in general, small parcels, bags, boxes, or any other kind of packages put up in a strong outer container.

III. Consular invoices must declare separately the gross, net, and legal¹ weights, as the law may require, of packages which, while of the same article, come in different parcels.

Packages containing cotton, linen, wool or silk textures, or goods may be declared collectively with their joint weights or measures in case the goods are of a like tariff class, and their difference in weight does not exceed 10 kilograms.

Any infraction of this provision is punishable by a fine of \$50, though the consignee is allowed until the inspector is named to dispatch the goods in which to correct errors.

IV. Interlineations, scratchings, erasures, or corrections causing a want of uniformity in the several copies of a consular invoice are prohibited. Should the want of uniformity affect elements essential to the determination of the duties, the latter will be regulated by the declaration "carrying the highest rate among the disagreeing invoices."

Such faults are tolerated in the cases following:

First. When they have been rectified by written explanations on the margin of the documents before taking out the consular certificate.

Second. When, notwithstanding the corrections, the several copies of the same document agree.

Third. When the interlineations, erasures, etc., relate to points having no bearing upon the question of duties.

V. When the same package contains goods paying different duties,

¹ By *net weight* is understood the real weight of the merchandise, without the immediate coverings (*almás*), packages, or wrappings.

By *legal weight* is understood the weight of the goods, including only the immediate coverings, wrappings, vessel, cardboard, wood, or tin in which they may come inside of the outer box, which serves as the general receptacle. When goods taxed on the legal weight have no immediate covering, but come loose in an outside box, the intrinsic weight of the goods shall be considered the legal weight. In ascertaining the legal weight no account must be taken of the straw or shavings with which the packages may be packed in the outside case, nor of the weight of the latter.

By *gross weight* is understood the weight of the merchandise with all its cases and wrappings inside and outside, without allowance for fillings, nettings, or hoops. When a package contains several articles taxed on the gross weight, the custom-house will apportion the tax among them according to their respective legal weights. Articles taxed on the gross weight shall pay on the total weight of the merchandise when they come without wrappings or packings, or contained in cases which are accessible.

When fabrics having fringes are dutiable on the square meter, the measurement shall include such fringes. If they are dutiable according to weight the weight must include that of the fringes.

including some paying on the gross weight, shippers must declare in the invoice, aside from the total weight of the package, the legal weight of each article contained therein, in order to arrive at the proper distribution of the gross weight. The declaring of the legal weight must be done without prejudice to the legal weight, piece, pair, thousand, or measures of the other goods not taxed on the gross weight.

VI. Invoices of packages containing only samples do not need consular certification. The invoices need only declare the vessel on which they are shipped, name of consignee, port of destination, mark, number, quantity, and class of packages, gross weight of each, and generic designation of the kind of samples.

Failure to comply with the foregoing will incur a fine not exceeding \$5 for each package.

VII. Shippers of goods must present for certification, before the sailing of the vessel, four copies of each invoice to the Mexican consul, consular or commercial agent residing in the place of shipment or in the port where the vessel is loading. Three copies must be left in the consulate, and the copy with certificate and receipt attached, which the Mexican official will deliver, is to be retained. This copy with the consular receipt attached shippers must transmit to the consignees of the goods.

VIII. In localities where there is no Mexican consul or consular agent, shippers will only make out invoices in triplicate, conforming otherwise with the foregoing provisions; transmitting on the same day, by registered mail, one copy to the Department of the Treasury and another to the collector of customs at the port of destination.

Shippers must require from the postmaster the necessary receipts, which must be forwarded to the consignee at the port of destination. There is no deviation from this requirement, and in default of an invoice with consular certificate or registered mail receipt, which must be presented by the consignee at the custom-house, is punishable by a fine in double the amount of duties on the goods imported.

IX. Invoices should be written in Spanish; but they will be admitted if written in any other well-known tongue, when shippers are unacquainted with the official language of the Republic.

X. Consignees of imported merchandise are responsible before the law for any infractions of the regulations by the carriers or shippers thereof.

XI. Packages should have only one mark and number. Should packages have marks or numbers other than those shown by the consular invoice and manifest the consignee will be fined \$1 for each package so marked or numbered. Firm names or factory addresses uniformly stamped on packages will not be considered as violative of this regulation, provided such initials, figures, and numbers are those by which each package may be distinguished from the rest.

XII. Live stock¹ shipments to México must be governed by the provisions following:

First. The shipper must appear before the Mexican consul stationed at the point from which the shipment is to be made expressing his intention to make the same.

Second. The consul must secure a veterinary expert who, at the expense of the shipper, must examine the live stock in question and issue the proper health certificate.

Third. This certificate will be *visced* by the said consul and should accompany the consular invoice to be presented at the custom-house of entry.

Fourth. On the live stock being entered at the custom-house the collector will designate an expert veterinary to examine the stock at the expense of the shipper and issue his certificate.

Sixth. If the stock is in a healthy condition it will be dispatched and delivered. If, on the other hand, it is diseased and the form of ailment is sufficiently proved the collector will decline to dispatch the stock and will notify the proper authority in order that the stock may be immediately sent out of the country, in which case no duties will be levied.

XIII. Fresh-meat shipments to México will be regulated by the same provisions as apply to live-stock importations save that the veterinary expert must examine the beeves before and after killing, and the meat must be shipped in refrigerators or so preserved physically or chemically that there will be no change in its condition. The meats on their introduction are subject to inspection by the Board of Health, at the expense of the importer.

Small shipments of fresh meat intended for the frontier settlements need not be shipped in refrigerators or otherwise preserved, should the collectors of customs deem it unnecessary.

XIV. For the certification of the documents which masters of vessels and shippers of goods must present, consuls will charge as follows:

1. For certifying ship's manifest conveying goods to the Republic	\$10.00
2. For certifying manifest of ship in ballast	4.00
3. For certifying each set of invoices:	
If the value of the goods declared in the invoice does not exceed \$100...	1.00
If the value exceeds \$100 but not \$1,000.....	4.00
For every excess of \$500 or fraction thereof	1.00
4. For certificates of any kind to masters or shippers.....	2.00
5. When said last-named certificates are requested in duplicate, triplicate, etc., for each extra copy	1.00
6. For certifying to errors in invoices, each set.....	2.00
7. For certifying to each set of permits to import through frontier custom-houses.....	.25

¹ Horses, sheep, goats, mules, and asses pay duty per head; cattle and hogs by weight.

Consuls or consular agents before issuing the certificate will require the affirmation or oath, according to the law of the country where made, of the manufacturer or seller to the effect that the value given the goods in the invoice is the true value. This oath must be subscribed on the margin of a copy of the invoice of sale.

XV. Samples intended to make known the goods they represent are entitled to certain privileges, as follows:

Pieces of cloth fabrics not exceeding 20 centimeters ($7\frac{1}{2}$ inches) in length, and which may include the whole width of the cloth, and all articles which by reason of not being complete are useless for sale are admitted free.

Samples of complete articles, such as manufactures of any kind, hardware, dry goods, handkerchiefs, shawls, hosiery, shirts, etc., must either pay the corresponding duties or be rendered unsalable by cuttings or perforations.

When dry goods or hardware sample cases contain complete articles paying different duties, and the weight of each class can not be determined, the whole case will pay the rate attachable to the highest duty-paying article contained therein.

Samples of complete articles an importer may be interested in preserving for reexporting may be admitted duty free, provided the collector is satisfied he can identify the articles when exported; but the collector will require a bond in double the amount of the duties, giving the party in interest up to six months time within which to reexport the articles through the same custom-house.

If the interested party shall present himself within the time mentioned to pay the duties corresponding to the articles, they will be received; but if these are not reexported within said term the bond will be forfeited.

The owner of samples desiring to export them through a custom-house other than that of entry must secure the permission of the Department of the Treasury.

XVI. Passengers landing at Mexican ports must show their baggage to the custom-house officer having its inspection in charge, and should they bring small quantities of articles for gifts or personal use which are dutiable they must make the fact known to the officer before the baggage is opened.

XVII. Passengers bringing with them, either in their baggage or separately, merchandise the duties on which exceed \$100 are bound to declare them in a consular invoice, conforming to the regulations for imports of merchandise. All articles which because of their class or quantity are not deemed to be of personal use are considered as merchandise.

XVIII. The following are considered as passengers' baggage and are duty free:

First. Personal apparel, if not excessive, the collectors being judges of the amount in view of the passengers' circumstances.

Second. Articles worn, or of personal use, such as jewelry, watch, chain, cane, etc., and one or two firearms, with their accessories and up to 100 cartridges.

Third. Instruments and tools the most necessary and indispensable for the exercise of a profession or trade, if the passengers are professors, artists, or artisans, in the understanding that pianos, organs, or barrel organs, and materials and accessories for the installation of laboratories, studios, or offices are excluded.

Fourth. Ninety-nine cigars, 40 packages of cigarettes, and half a kilogram of snuff or chewing tobacco, if the passengers are adults.

XIX. Should the passengers be artists of an opera, dramatic, circus, or other company, besides the foregoing articles they may introduce free the costumes and scenery which form part of their baggage, being bound to reexport the same within one year.

XX. Passengers bringing with them any household furniture, will be allowed a rebate of duty corresponding to the depreciation of value in consequence of its use.

XXI. Should passengers declare that their baggage includes nothing but articles of personal use and the inspection show that they bring dutiable merchandise, such merchandise shall pay double duties.

XXII. Most of the maritime custom-houses have warehouses attached, where goods may be left on deposit, which is limited to one month if the goods are perishable, or not longer than six months if otherwise. If not withdrawn within fifteen days after the expiration of the six months, the goods are sold at public auction.

The warehouse charges are as follows: For the first and second month, 1 cent daily for each 100 kilograms or fraction thereof; for the third and fourth month, 2 cents daily for each 100 kilograms or fraction thereof; for the fifth and sixth months, 3 cents daily for each 100 kilograms or fraction thereof.

Shippers should bear in mind that the weights and measurements of articles should be given in the metric system; that articles should be packed in cases or containers, according to the class of weight upon which duties are assessed; that is, goods upon which duties are charged on the gross weight should not be packed with goods paying by net or legal weight, or vice versa.

By treaty provisions between the United States and México vessels of the former country are on the same footing in Mexican ports as Mexican vessels as regards tonnage, harbor, and light dues, pilotage,¹ salvage, and all local charges. The coasting trade is, however, reserved by either nation for its own vessels. United States vessels

¹ Pilotage is not obligatory under the laws of México.

may import into Mexican ports merchandise the growth or manufacture of the United States on the same terms as if they were imported in Mexican bottoms. The duties are to be no higher or other than those levied on similar merchandise the growth or manufacture of the most-favored nation. In United States ports Mexican vessels and merchandise are accorded the same privileges enjoyed by American vessels and merchandise in Mexican ports.

Where there are no Mexican vessels to carry on the coastwise trade foreign sailing and steam vessels are permitted to engage in such trade. When the quantity of merchandise prepared for shipment from one port to another of the Republic is so small that it would not suffice to fill a Mexican vessel its shipment upon a foreign steamer is allowed.

On May 1, 1896, the Mexican Constitution was amended so as to abolish the *alcabala* or interstate customs duties, which it inherited from Spain, and which had for so many years acted as a stumbling block to the internal trade of the country.

By decree of May 12, 1896, a stamp duty of 7 per cent, collectible on and after July 1, 1896, was levied on the amount of import duties payable by foreign imported goods.

A decree bearing the same date also abolished the *portazgo* or *octroi* duties in the Federal District, and another great stride forward was taken. This same date saw another decree promulgated—one establishing an import custom-house in the city of México, as auxiliary to the frontier and maritime custom-houses, connected by rail with the capital.

On November 12, 1897, the President of the United States issued a proclamation suspending tonnage dues on Mexican vessels.

The Mexican Free Zone, according to an official description furnished by the Mexican authorities,¹ is as follows:

“There is understood by the term ‘Free Zone’ a strip of national territory which, covering all the northern frontier of the Republic in the States of Tamaulipas, Coahuila, Chihuahua, Sonora, and the Territory of Lower California, from the Gulf of México to the Pacific Ocean, extends in a latitudinal direction 20 kilometers (12.42 miles) from the frontier border toward the interior.

“It was established in the beginning from Matamoros to Monterey, Laredo (to-day Laredo of Tamaulipas) by Col. Ramón Guerra, governor of the State of Tamaulipas, by means of a decree dated the 17th of March, 1858, which was sanctioned by President Juarez the 30th of July, 1861.

“The tariff of the 1st of January, 1872, left it in existence, and the

¹ Monthly Summary of Commerce and Finance of the United States, No. 12, series 1898–99, Bureau of Statistics, Treasury Department, 1899, p. 3182.

tariff of 1885 caused its extension to all the frontier. The general ordinance of custom-houses of 1887, as well as that of 1891, which is now in force, preserved it, although with modifications of importance, especially as regards collection of duties.

"The franchise granted the Free Zone consisted, in the beginning, in not levying any duty upon imported articles; afterwards, however, some small duties, purely local, were established, and the ordinance of 1887 established as a fixed basis 3 per cent on the value of the duties according to tariff—a basis which was raised to 10 per cent by the ordinance of 1891. By subsequent decrees the duties were raised $1\frac{1}{2}$ per cent for the municipality and 7 per cent for stamps for internal revenue, the result of all this being that the merchandise introduced into the Free Zone from abroad now paid $18\frac{1}{2}$ per cent upon the importation duties according to tariff.

"For the better comprehension of this explanation, there is here given an example of the duties paid by a certain article, according to its destination, either to the interior of the country or to the Free Zone.

"Let us suppose a bale of cotton weighs 100 kilograms (220.46 pounds). If destined for the interior of the country, it will pay duties as follows:

Description.	Duties.	
	Mexican currency.	United States currency.
100 kilograms (220.46 pounds) at 7 cents (3 cents).....	\$7.00	a \$3.10
2 per cent for harbor works.....	.14	.06
$1\frac{1}{2}$ per cent (municipal).....	.10	.04
7 per cent (revenue stamps).....	.49	.22
Total.....	7.73	3.42

a The reductions in this report are made on the basis of the valuation of the Mexican dollar given April 1, 1898, by the Director of the United States Mint—i. e., \$1 Mexican = 44.4 cents.

"If that bale is destined to the Free Zone, it must pay—

Description.	Duties.	
	Mexican currency.	United States currency.
10 per cent on \$7.....	\$0.70	\$0.30
$1\frac{1}{2}$ per cent on \$7 (municipal).....	.10	.05
7 per cent on \$7 (stamps).....	.49	.22
Total.....	1.29	.67

“If this same bale, after having been imported to the Free Zone, is shipped to the interior of the country, it must pay, in addition to the above—

Description.	Duties.	
	Mexican currency.	United States currency.
90 per cent on \$7 (\$3.10).....	\$6.30	\$2.79
2 per cent for harbor works.....	.14	.06
Total.....	6.44	2.85

which is equal to the amount charged for importation of the bale directly to the interior (\$7.73=\$3.42).

“It must be noticed that not all the merchandise that enters through the custom-houses of the north is destined for the Free Zone, and that much that is primarily imported for consumption there is afterwards shipped to the interior.

“The greater part of the merchandise that enters through Laredo, Tamaulipas, Porfirio Díaz (Eagle Pass), City of Juarez (El Paso, Tex.), and Nogales, Sonora, pays at once the entire duties and is forwarded immediately to the interior.

“The custom-house of Matamoras has little importation, and those of Guerrero, Camargo, Mier, Boquillas, Lasabe, Tiguana, and La Morita have practically none.

“The greater part of the goods imported by these last is consumed by the inhabitants of the towns named and their jurisdictions, and all are United States goods, such as hams, potatoes, lard, butter, beer, matches, coarse cloth material, etc.

“The principal cities found in the Free Zone are Matamoras, Camargo, Mier, Guerrero, Laredo City, Porfirio Díaz (Piedras Negras), City of Juarez (Paso del Norte), and Nogales. The others are small towns which have little commercial importance. The total population of the Free Zone could hardly be estimated to be 80,000 or 100,000 people.

“In the Free Zone there are no industries worth mentioning, nor is it possible to establish any, for the general ordinance of the custom-house permits the introduction to the interior of the country of industrial products manufactured in the Free Zone only on payment of the regular duties, which are equal to those levied on foreign goods of the same kind. Exportation to the United States of America would be difficult on account of its protective tariff, and the consumption in the Free Zone would not be sufficient to sustain industrial establishments of any importance, especially as not a single railroad exists, and transportation of merchandise is carried on in certain parts over difficult roads by means of the rudimentary system of ox carts.

“According to statistics of the frontier custom-houses, the duties on importations into the Free Zone of European merchandise, etc., during the two years of 1895-96 and 1896-97 were:

Custom-house.	Amount of duties calculated as a whole.	
	Mexican currency.	United States currency.
Mier		
Guerrero		
Boquillas		
Tiguana		
La Morita		
Camargo		
Laredo, Tamaulipas	\$262,326	\$116,473
Ciudad Juarez	100,774	44,744
Ciudad Porfirio Diaz	80,914	36,126
Nogales	83,182	36,933
Matamoros	80,643	35,805
Total in two years	607,839	269,881
Average per year	303,919	134,940

“Of this amount at least $33\frac{1}{3}$ per cent can be calculated to have been shipped later into the interior, paying the regular duties; this would amount to \$101,306.50 (\$44,980), leaving as a balance consumed in the Free Zone \$202,613 (\$89,960).”

CHAPTER XII.

FINANCIAL ORGANIZATION—PUBLIC DEBT.

The financial question in México has been one of the most perplexing problems that ever presented itself to the statesman's mind. From the moment that the country emerged from its centuries of colonial rule it was confronted with the gravest economic difficulties. The tributary system, based upon monopoly and exclusive privileges, which had prevailed before the yoke of Spain was thrown off, could not be continued under the conditions obtaining among an emancipated and autonomic people. Without any previous experience, they were compelled to change, improvise, and try new systems. The many revolutions and consequent changes in the administrations served but to add to the perplexity of the situation, and it has required a high order of ability to bring the finances of the country to their present condition.

In 1823 the Mexican Government issued paper money, with results so deplorable that no administration has since ventured to repeat the experiment. The many difficulties which have beset the other American Republics through depreciated paper money have thus been avoided by México.

The revenues of the Republic are subdivided into four groups or classes, which in 1898-99 yielded as follows:¹

I. Foreign-commerce taxes.

Import duties	\$26, 443, 847. 86
Export duties	1, 066, 769. 78
2 per cent for port improvements	525, 384. 60
Special port taxes	26, 597. 71
Tonnage, light-house, and warehouse dues.....	174, 191. 76
Sailing licenses	1, 216. 00
Pilots' and harbor masters' dues.....	156, 718. 54
Health office receipts	69, 063. 42
Consular dues	260, 324. 00
Consular and diplomatic certificates abroad.....	8, 259. 40
Veracruz shelter (<i>cobertizo</i>) dues	6, 107. 58
Total	28, 738, 480. 45

¹ Report of the Secretary of the Treasury to Chamber of Deputies, 1898-99.

II. Interior Federal taxes.

Stamp tax		\$23, 178, 587. 68
Embracing—		
Regular stamps	\$8, 193, 970. 68	
Federal tax	6, 091, 149. 36	
7 per cent on imports	1, 971, 144. 21	
Mining tax	684, 479. 16	
3 per cent on gold and silver	2, 293, 778. 90	
Real-estate tax	14, 284. 00	
Manufactured tobacco	1, 395, 212. 17	
Spirits	895, 577. 89	
Cotton yarn and fabrics	1, 525, 958. 05	
Miscellaneous, fines, etc.	113, 033. 26	
Mintage dues and charges		1, 410, 756. 96
Patent and trade-mark dues		6, 090. 00
Total		24, 595, 434. 64

III. Interior, district and territorial taxes.

Direct taxes on real estate, professions, patent rights, flour, and pulque	\$2, 799, 303. 66
Inheritance tax	159, 148. 61
Minor taxes	107. 74
Total	2, 958, 555. 01

IV. Public service and minor sources.

Postal service	\$1, 513, 402. 19
Telegraph service	980, 715. 44
Tehuantepec Railroad	227, 437. 00
Lottery, fines, etc.	1, 124, 688. 11
Total	3, 846, 742. 74

These figures show a grand total of \$60,139,212.84 for the period under consideration.

A resume of the revenues of the Republic from 1894-95 to 1898-99 gives the following figures:

Group.	1894-95.	1895-96.	1896-97.	1897-98.	1898-99.
First.....	\$19, 870, 987. 80	\$23, 658, 692. 61	\$23, 639, 580. 91	\$23, 284, 989. 17	\$28, 738, 480. 45
Second	17, 599, 608. 22	20, 418, 848. 54	21, 589, 407. 27	22, 925, 702. 31	24, 595, 434. 64
Third	3, 378, 814. 48	3, 357, 611. 81	2, 705, 761. 11	2, 794, 458. 41	2, 958, 555. 01
Fourth	3, 096, 288. 55	3, 086, 317. 46	3, 565, 879. 46	3, 692, 834. 66	3, 846, 742. 74
Total	43, 945, 699. 05	50, 521, 470. 42	51, 500, 628. 75	52, 697, 984. 55	60, 139, 212. 84

The estimated expenditures for the year 1898-99 were as follows:

Legislative power	\$1, 019, 242. 50
Executive power	82, 468. 75
Judicial power	449, 450. 80
Department of Foreign Relations	540, 647. 80
Department of Government	3, 685, 516. 25
Department of Justice and Public Instruction	2, 345, 311. 05
Department of Promotion	745, 626. 86
Department of Communications and Public Works	3, 652, 111. 04
Department of Treasury and Public Credit	26, 155, 716. 90
Department of War and Navy	11, 996, 356. 24
Total	52, 672, 448. 19

Additional legislation increased certain appropriations and reduced others, the total increase being estimated at \$4,590,050.82, and the decrease at \$214,756.12, leaving a net increase of \$4,375,294.70; thus aggregating a total appropriation for public expenditures of \$57,047,742.89. The sum of \$3,430,328.48 was not used, however; actual expenses being thus reduced to \$53,617,414.46, of which amount \$117,872.52 was still unpaid into the Treasury at the end of the fiscal year, so that the net total of expenditures reached the sum of \$53,499,541.94. The balance remaining to the credit of the Government is therefore shown as follows:

Revenues, as stated	\$60, 139, 212. 84
Net expenditures	53, 499, 541. 94
Balance	6, 639, 670. 90

Taking as a basis the year 1894-95, which was the first to show a surplus after the financial crisis of 1891, the following figures show, in round numbers, the state of the Treasury up to and including the year 1898-99:

Year.	Receipts.	Expenditures.	Surplus.
1894-95	\$43, 946, 000	\$41, 372, 000	\$2, 573, 000
1895-96	50, 521, 000	45, 070, 000	5, 451, 000
1896-97	50, 501, 000	48, 330, 000	3, 170, 000
1897-98	52, 698, 000	51, 815, 000	883, 000
1898-99	60, 139, 000	53, 499, 000	6, 640, 000

The reserve of cash held in the Treasury as the result of accumulated surpluses amounted on June 30, 1899, to \$4,856,000 in gold and \$17,824,000 in silver; reducing the gold at the rate of foreign exchange ruling on the date mentioned, the cash reserve amounted to \$27,536,000 in silver, the currency of the country. The large surplus shown for the financial year 1898-99 was due mainly to the heavy increase in customs duties, though the internal revenues also showed a notable increase.

The budget for 1899-1900 estimated the revenues of the Republic for the year, in round numbers, at \$54,913,000 and the expenditures

at \$54,886,000, leaving a balance of \$27,000 to the credit of the Treasury. For 1900-01 the revenues are estimated at \$58,234,000 and the expenditures \$58,009,082.92, the surplus for the year being, therefore, \$224,917.08. The estimated receipts for 1900-01 are classified as follows:

First group.....	\$26, 868, 000
Second group	24, 531, 000
Third group.....	3, 067, 000
Fourth group	3, 768, 000
Total	58, 234, 000

The two main points in this estimate are the abolition of the coffee tax, for the relief of the planters, and the lease of the Tehuantepec Railway, the Government proprietorship of which had affected adversely both receipts and expenditures.¹ An arrangement was made whereby the contractors should complete the line and the port works at Coatzacoalcos and Salina Cruz, in return for the receipts of the road during fifty years.

The estimated expenditures show an increase of \$3,057,060.81 in all branches except the legislative and judicial, while there is a decrease of \$1,076,607.55 in the item of the public debt, the result of the successful conversion of the foreign debt from a 6 to a 5 per cent basis. The net increase is therefore \$1,980,453.32 as compared with the preceding year.

The public debt of México is represented by bonds of differing rates of interest and payable in gold or silver, according to designation.

According to Romero,² the history of the Mexican foreign debt begins in 1825, very soon after the independence of the country was established, when two loans were contracted in London, both for £10,000,000, the interest on which, owing to the disturbed conditions prevailing in the Republic, was not promptly paid, the bonds consequently falling to a low nominal price. In 1851, after the war with the United States, that debt was refunded into a new bond issue, the interest on which was reduced from 5 to 3 per cent. The internal affairs of the country not permitting the payment of the interest on these bonds, in 1888 a new adjustment was made, by which gold-bearing bonds at 6 per cent were issued, the interest on which has since been paid promptly, the bonds reaching par.

From 1849 to 1856 bonds were issued to pay claims of English, French, and Spanish subjects, under certain conventions, and such bonds were subsequently exchanged at differing rates for the 6 per cent gold bonds of the foreign debt.

In 1888 another loan was negotiated in London for £3,000,000, at 5

¹The receipts of this line in 1898-99 amounted to \$227,437, the working expenses being \$700,000.

²Mexico and the United States, New York, 1898, p. 129.

per cent, for the construction of the Tehuantepec Railroad. The subsidies granted to railway companies were payable in silver with a percentage of the import duties, but as they amounted to a considerable sum and were a heavy drain on the national treasury, the Government, in 1890, contracted another loan in London, on a gold basis, at 6 per cent interest, to be applied to the subsidies due most of the railway companies up to that date.

In 1850 a domestic or interior debt was contracted, covered by bonds bearing interest payable in silver at 3 and 5 per cent. There was, besides, other indebtedness of various kinds, growing out of loans and other obligations entered into at a time when the Government revenues were not sufficient for its expenditures. All these debts have been consolidated into new bonds, bearing interest at 3 and 5 per cent, payable in silver, and the railway subsidies remaining unpaid from the proceeds of the loan of 1890 have been met by bonds at 5 per cent, both interest and principal being paid in silver.

Romero¹ states that "it is very onerous to México, when it is on a silver basis, to pay in gold the interest of its foreign debt, because we have to buy gold at current prices, and it costs us now double its current price. When silver was about 50 cents on the dollar, as compared with gold, 6 per cent interest of our foreign debt cost us 12 per cent, and of course the further silver is depreciated the greater will be the cost of paying the interest of our gold debt." President Díaz gives, in his report of November 30, 1896, the following data about the cost to the Mexican treasury of buying exchange to place in London the funds to pay the gold interest on the foreign debt:

Fiscal year:

1898-99.....	\$729, 178. 17
1890-91.....	2, 314, 477. 77
1891-92.....	3, 225, 246. 77
1892-93.....	5, 101, 223. 57

The total amount of the Mexican debt on the 30th of June, 1896, was \$203,225,067.34, as follows:

Sterling Mexican debt	\$114, 675, 895. 49
Payable in silver	88, 549, 111. 80

In 1896-97 a third division of the debt was introduced under the name of floating debt, which, at the close of the fiscal year named, stood as follows:

Debt payable in foreign coin at the rate of \$5 per pound sterling...	\$108, 865, 528. 00
Bonded debt payable in silver.....	91, 951, 573. 21
Floating debt ²	1, 473, 696. 70
Total	202, 290, 797. 91

¹ Opus cit., p. 130.

² The floating debt consists of credits and other certificates not presented for conversion, uncollected interest, and unpaid balances of former estimates.

At the end of the fiscal year 1897-98, the public debt, including uncollected interests, stood as follows:

Foreign debt	\$109,509,544.00
Mexican debt	103,997,703.23
Floating debt	1,401,808.63
Total	214,809,055.86

At the end of the fiscal year 1898-99 the debt, in detail, stood as follows:

Debt.	Principal.	Uncollected interest.	Total.
<i>Payable in foreign money at the rate of \$5 per £1.</i>			
Bonds of the loan of 1888	\$50,041,900.00	\$808,692.50	\$50,845,592.50
Bonds of the loan of 1890	29,296,700.00	466,992.00	29,763,692.00
Bonds of the loan of 1893	14,745,600.00	225,199.50	14,970,799.50
Mortgage bonds of the Tehuantepec Rwy	13,365,000.00	.....	13,365,000.00
Total foreign gold debt	107,449,200.00	1,495,884.00	108,945,084.00
<i>Payable in silver.</i>			
Interest-bearing bonds:			
Consolidated 3 per cent bonds	50,225,575.00	831,372.70	51,056,947.70
Redeemable 5 per cent bonds—			
First series	19,832,200.00	30,294.48	19,862,494.48
Second series	19,780,300.00	33,482.50	19,813,782.50
Third series	14,251,300.00	4,967.50	14,256,267.50
Monterey and Mexican Gulf Rwy. bonds	140,000.00	1,080.00	141,080.00
Tula, Pachuca and Tampico Rwy. bonds	142,000.00	.....	142,000.00
Oaxaca Rwy.'s trunk line subsidy bonds	9,260,000.00	.....	9,260,000.00
Tonala wharf bonds	7,000.00	.....	7,000.00
Pachuca, Zacualtipán and Tampico Rwy. bonds	3,000.00	.....	3,000.00
Veracruz port bonds	25.00	.75	25.75
San Marcos and La Barra de Nautla Rwy. bonds .....	.....	50.00	50.00
Total silver bonds	113,641,400.00	901,247.93	114,542,647.93
Noninterest-bearing bonds (floating debt):			
Balance certificates from July 1, 1882, to June 30, 1894	247,522.69	.....	.....
Uncollected certificates for railway construction	219.17	.....	.....
Uncollected balances on budgets previous to July 1, 1895, redeemable, according to the law of Oct. 31, 1895	105,588.58	.....	.....
Uncollected balances, payable wholly in cash, corresponding to the budgets from 1895-96 to 1898-99	333,547.70	.....	.....
Sundry balances, collection pending, in compliance with the adjustment of public debt	266,741.12	.....	.....
Total uncollected balances and floating debt	953,619.21	.....	.....

RESUME.

Foreign debt (gold)	\$108,945,084.00
Mexican debt (silver)	114,542,647.93
Floating debt	953,619.21
Total	224,441,351.14

The debt proper—that is, not including the uncollected interest—for the years 1896-97, 1897-98, and 1898-99, stood as follows:

	1896-97.	1897-98.	1898-99.
Gold bonds	\$108,555,100.00	\$107,995,600.00	\$107,449,200.00
Silver bonds	91,114,325.00	103,118,050.00	113,641,400.00
Floating debt	1,473,696.70	1,401,808.63	953,619.21
Total	201,143,121.70	212,515,458.63	222,044,219.21

In his report to Congress¹ (1898-99) the Secretary of the Treasury and Public Credit supplemented the statement of the debt with several remarks, showing in substance that the debt payable in foreign gold is represented by the value it would attain should the foreign rate of exchange be at par, the supposed value of \$5 per pound sterling being the most approximate valuation. The floating debt is made up of credits which the parties interested have not collected or converted into other bonds according to the laws governing the public debt. The Federal Treasury has not among its floating debt a single "short-time" bond, either interest-bearing or not, issued since July, 1894, in payment of any claims. As to the uncollected or unclaimed interest on either the gold or silver debt, the respective amounts are deposited in the banks and banking houses in charge of said debts, those of the silver debt being placed in the National Bank, and those of the gold bonds of 1888, 1890, and 1893 with the firm of S. Bleichroeder, of Berlin.

On June 30, 1899, the gold bonded debt showed a decrease of \$546,400 as compared with the same date of the preceding year. The silver bonds of the 3 per cent consolidated debt, the 5 per cent redeemable debt of the first and second series, and the bonds of the Monterey and Mexican Gulf Railway, on the date in reference, showed a decrease of \$619,950, while the decrease of the floating debt amounted to \$448,189.42, a total decrease of \$1,614,539.42 being thus indicated for 1899 as compared with 1898. This sum, which represents the amortization of bonds during the fiscal year, was in reality larger, as the \$546,400 (gold) paid on the foreign bonds represents nearly double that amount, by reason of the expense incurred for exchange and placement of funds; so that the report quoted estimates the money spent in the reduction of the public debt in 1898-99 at more than \$2,160,000.

The only bonds whose circulation on June 30, 1899, was larger than on the same date of the preceding year were the 5 per cent redeemable-debt bonds, whose increase was \$11,185,100, a new issue for that amount having been made during the year in order to foster the development of certain works of public utility, such as the port improvements of Veraacruz and Tampico, to subsidize nine railroad companies, and also to replace the bonds of the Monterey Railroad.

In the same month of June, 1899, negotiations were entered into, conducted by the Secretary of the Treasury in person, having for their object the conversion of the foreign gold debt, which culminated in the signing of a contract in Berlin, whereby J. P. Morgan & Co., of New York, J. S. Morgan & Co., of London, S. Bleichroeder, the Deutsche Bank, and the Dresden Bank of Berlin undertook the con-

¹ "Nota remitiendo á la Cámara de Diputados del Congreso de la Unión la cuenta del Erario Federal, año económico 1898-99" (p. 35).

version of the entire foreign debt of the Republic of México, viz: Six per cent loans of 1888, 1890, and 1893, and the 5 per cent Tehuantepec loan, heretofore issued in London and Berlin, into a 5 per cent consolidated external gold loan due within forty-five years at par by semiannual drawings, which may be increased after the year 1909, the first one to take place in June, 1900, or by purchase in the market if same can be made under par. Principal and interest of the bonds payable in gold in Germany, London, Amsterdam, Berlin, or New York, in the last city at the rate of \$4.85 per pound sterling. Bonds to be issued in denominations of from £20 to £1,000, at the option of the subscriber. The bonds are secured by a special hypothecation of 62 per cent of the import and export duties of the Republic of México. The annual interest and sinking fund requirement for the entire external debt of México, as consolidated by the new issue of bonds, is about \$6,200,000 gold, or, at present exchange, about \$13,000,000 of silver, the total amount of the issue being £22,700,000, of which £5,000,000 are reserved for allotment in the United States and in Holland. The issue in England and Germany at the present time will be limited in favor of holders of the existing bonds, who will be given the right of conversion.

Commenting upon this operation "El Mundo,"¹ a Mexican journal, says:

"The Mexican Government, with 6 per cent gold securities, quoted at 102 and 103, and 5 per cent silver at 99 and 99½, has succeeded in placing, on the best markets of Europe, a 5 per cent loan, over one-half of it (£13,000,000) at 96 flat and the balance at 97¼. According to this arrangement the Mexican Government will receive:

For the £13,000,000 at 96.....	£12, 480, 000
For the £9,700,000 at 97¼ optional.....	9, 423, 250
Total.....	21, 913, 250
Less 1 per cent commission on £22,700,000.....	227, 000
Balance	21, 686, 250

"This, being estimated at the rate of \$5, gold, per pound sterling, is equivalent to \$108,431,250, gold, but as our debt, including the mortgage loan on the Isthmus Railroad, amounts at present to \$107,286,100, gold, there will be a surplus of \$1,145,150, gold, to meet the necessary expenses connected with the loan and the further necessities of the Treasury."

On the 5th of July, 1899, President Díaz issued a decree bearing upon the subject, stating that by virtue of the authorization granted to the Executive by the law of June 2, 1899, for the conversion of the Mexican public gold debt, and in accordance with the terms of the contract signed at Berlin, from the 1st of September following,

¹ "Los Estados Unidos Mexicanos—Sus progresos en veinte años de paz—1877-1897"—R. de Zayas Enriquez—New York, p. 252.

62 per cent of the duties which, according to law, are payable in the maritime and frontier custom-houses of the Republic, without regard to the place where the merchandise is cleared, shall be paid only in the special certificates referred to in article 3 of the decree.¹

Cash shall not be accepted in the payment of these duties unless there are no certificates at the place where they are to be paid. In this case the custom-house shall hold the amounts at the disposal of the National Bank of México, from which it shall receive equivalent certificates in exchange. Anyone disobeying this rule shall be obliged to pay twice the amount that was not paid in certificates, half of this fine being payable in the certificates, and the other half in money, which shall go to the informant.

The General Treasury is to deliver to the National Bank the certificates as they are issued, and to open a special account with the bank under this head. In order that the certificates may be admissible to the custom-houses, they must bear a special mark of the bank and of the agent intrusted by the bank with their sale at the place where they are receivable.

As long as all the outstanding bonds of the loans of 1888, 1890, and 1893 have not been converted nor called in and paid off in cash, the National Bank of México will, in preference to anything else, set aside from the proceeds of the 62 per cent certificates such sums as may be necessary to meet the interest and sinking fund service of the bonds that have not been converted nor called in for payment in cash, with the understanding that the sum applicable in a year to each of said loans shall be reduced in proportion to the amount of bonds converted. The balance of the 62 per cent assignment shall be applied to the service of the 5 per cent consolidated foreign debt of 1899 until, through conversion or payment in cash of all the bonds of the three loans above mentioned, the whole of said 62 per cent assignment shall be applied exclusively to the service of the new debt.

From the 1st of September, 1899, the certificates which, according to decrees still in force, are received in payment of a portion of the import and export duties, shall be replaced, for the purpose set forth by the special certificates created by the decree, unless, in the event of the 6 per cent loan not having been converted, either wholly or in part, by the 1st of September, other arrangements are made by a subsequent decree.

The certificates referred to must be sold for silver and at par. Their

¹ART. III. As provided by Article I, the General Treasury of the Federation shall at once issue the certificates in question, which shall be of the form and have the special marks to be determined by the Finance Department, and shall be divided into four series: The first of the value of ten dollars, the second of fifty, the third of one hundred, and the fourth of five hundred. Issues of each series shall be made gradually as determined by the Department of Finance.

sale above par shall be visited with a fine of three times the excess collected.

The receipts of the Mexican Treasury from July 1, 1881, to June 30, 1899, were as follows:

Year ending June 30—	Receipts.	Year ending June 30—	Receipts.
1882	\$30,466,093.74	1891	\$37,391,804.99
1883	32,850,931.25	1892	37,474,879.20
1884	37,621,065.29	1893	42,813,455.71
1885	30,660,434.24	1894	40,211,747.13
1886	28,980,895.76	1895	43,945,699.05
1887	32,126,509.07	1896	50,521,707.42
1888	40,962,045.23	1897	51,500,628.75
1889	34,374,783.32	1898	52,697,984.55
1890	38,566,601.69	1899	60,139,212.84

The amount of cash on hand on June 30, 1899, to the credit of the Government in the several depositories was \$22,679,925.10, showing a gain of \$5,863,214.67 over the preceding year. This amount was represented in gold and silver as follows: Gold, \$4,855,677.48 and \$17,824,247.62 in silver; while for the preceding year the stock was \$4,472,621.49 for gold and \$12,344,088.94 for silver, a gain in favor of 1899 of \$5,863,214.67, thus showing an increase in the gold stock of \$383,655.99 and in the silver of \$5,480,158.68. The gold stock mainly represents the amounts subject to the payment of the loans payable in gold, the remainder being at the mint, the financial agency in London, and in the hands of the diplomatic and consular agents of the Republic.

Reducing the gold stock to silver, the cash on hand at the end of 1898-99 stands as follows:

Gold stock, as stated	\$4,855,677.48
Premium at the rate of 24 pence per peso	4,855,677.48
Silver value of the gold on hand	9,711,354.96
Silver stock as stated	17,824,247.62
Total silver	27,535,602.58

Or a net gain of \$5,596,616.15 in silver over the gold and silver stock of the preceding year, reduced to silver.

The gold and silver stock on hand was placed as follows on the 30th of June, 1899:

General Treasury	\$278,024.23
Administrative Bureaus	2,681,671.72
Treasury dependencies	164,424.51
Maritime and frontier custom-house	130,640.73
Financial agency in London	53,809.54
Legations and consulates	53,670.31
Paymasters, disbursing officers, and agents	75,528.26
Banks and banking houses	19,242,155.80
Total	22,679,925.10

This amount was further divided as follows:

Cash already appropriated	\$7, 032, 300. 52
Cash at the disposal of the Government.....	15, 647, 624. 58

This last amount represents the cash at the disposal of the Government, absolutely untrammelled by any claims, and speaks eloquently for the ability and statesmanship of the Secretary of Finance, Señor José Yves Limantour.

In the report to Congress, already mentioned (1898-99), the Secretary of the Treasury gives the following statement of the assets and liabilities of the Government on June 30, 1899, not including the public debt:

Assets	\$28, 789, 351. 63
Liabilities	5, 498, 781. 16
Balance to nation's credit	23, 290, 570. 47

Deducting from the assets the gold and silver stock, \$22,679,925.10, plus the balances on certain obligations, the total assets will be \$3,082,572.12, while the liabilities, not including the debt, minus the balances on certain obligations (\$3,026,854.41), amounted to \$2,471,926.75, thus leaving a net balance of \$610,645.37 in favor of the assets. The Secretary of the Treasury supplements this statement with certain remarks showing that the Federal Treasury is fully able to meet its liabilities, with the exception of the amount represented by the public debt.

CHAPTER XIII.

MINTS, CURRENCY, BANKS, AND BANKING.

Since the enactment of the law of June 6, 1887, the production of gold and silver has greatly increased in the Republic, and it is due to this law that the latter metal has attained its present enormous output. The main objects of the law in reference were: The reduction of the cost of metal production; to relieve the mining industry as much as possible of the onerous taxes and obstacles which retarded its free development; to lower the cost of the principal raw materials required in the industry, and also to attract capital. Further legislation, on June 6, 1892, gave a new impetus to mine production, the output of silver from 1886 to 1891 being valued at \$199,208,204, while from 1891 to 1896 it aggregated \$267,122,418. By the law of June 4, 1894, the Executive was authorized to grant concessions under certain conditions to those engaged in the exploitation of gold mines, this industry having increased its production from \$920,702 in 1890-91 to \$4,744,542 in 1894-95, and to \$6,054,078 in 1895-96. This calculation is made on the basis of \$20 silver per ounce of gold, which is the standard used in the Mexican statistical tables. It is claimed that these figures do not cover the true production of the gold districts, as almost all the exports of this metal are shipped clandestinely.¹

Mints were established in México in 1537, the custom being sometimes followed of renting them to private individuals, who collected a mintage charge of nearly $4\frac{1}{2}$ per cent upon the amount of bullion coined. Until within six years ago there were thirteen mints in the Republic, but as increased facilities of transportation have reduced the difficulties attendant upon the carriage of the bullion from mine to mint, this number has been decreased to four, one being in the City of México, one in Guanajuato, one in Zacatecas, and one in Culiacán. Besides these mints there are Federal assay offices situated at Aguascalientes, Alamos, Chihuahua, Durango, El Paso (Texas), Guadalajara, Hermosillo, Monterey, Oaxaca, San Luis Potosí, Sierra Mojada, and Zacatecas.

¹ "Los Estados Unidos Mexicanos, etc.," Rafael de Zayas Enriquez, New York, p. 20.

The receipts of precious metals at the Federal assay offices and mints from 1889-90 to 1898-99 were as follows :

Years.	Pure silver. <i>a</i>			Pure gold. <i>a</i>		
	Kilograms.	Grams.	Value.	Kilograms.	Grams.	Value.
1889-90	632,935	879	\$24,814,965.28	1,464	619	\$979,059.75
1890-91	632,951	795	24,814,782.38	1,609	777	1,089,702.32
1891-92	712,572	272	28,096,084.85	2,470	897	1,657,716.98
1892-93	772,636	696	30,383,428.66	2,840	32	1,902,296.43
1893-94	886,178	76	34,845,542.68	3,381	733	2,260,865.32
1894-95	981,222	111	38,934,191.75	3,991	498	2,674,278.35
1895-96	1,314,849	340	53,797,060.63	6,289	93	4,247,759.83
1896-97	1,342,931	298	54,946,033.97	5,788	694	3,909,782.42
1897-98	1,496,969	402	61,248,503.08	5,712	426	3,858,269.06
1898-99	1,417,216	194	57,985,400.58	5,986	485	4,043,373.70

a From 1889 to 1895 silver was quoted at \$39.109 per kilogram and from 1895 on at \$40.915. Gold was quoted during the same periods at \$643.527 and \$675.417 per kilogram respectively.

The exports of these metals from the mints and assay offices of the Republic during the same period were as follows:

	Kilograms.	Grams.	Value.
Pure silver.....	3,910,704	135	\$160,311,249.27
Pure gold.....	29,705	125	20,064,066.03
Total	3,940,409	260	180,375,315.30

From colonial times until 1898-99 the total coinage is represented by the following figures:

From—	Gold.	Silver.	Copper.	Total.
1537 to 1897.....	\$126,129,466	\$3,400,846,135	\$7,147,668	\$3,534,123,263
1897 to 1898.....	459,219	21,427,057	31,600	21,917,876
1898 to 1899.....	715,882	20,184,117	10,694	20,910,693
Total.....	127,304,561	3,442,457,309	7,189,962	3,576,951,832

To the above figures should be added the copper coined by Viceroy Mendoza for \$200,000, and \$31,667.67 coined by Mr. Ayllón, thus making a grand total of \$3,577,183,499.67. During the presidency of General Manuel Gonzalez nickel to the value of \$4,000,000 was coined, but this was subsequently withdrawn from circulation.

Under date March 27, 1897, the President issued a decree (No. 42) whereby gold and silver are subject to the following taxation:

(1) Interior stamp tax at the rate of 3 per cent on the value of said metals.

(2) Mintage dues at the rate of 2 per cent on the value of said metals.

(3) Assay dues, in conformity with the tariff that the Department of the Treasury may promulgate.

(4) Smelting, refining, and other dues as they may be decreed by the Treasury Department.

The stamp and mintage dues as well as the assay dues will always be paid, whether the pieces are to be coined or whether the metals or substances are to be exported. The smelting dues are to be collected upon such pieces that, not being homogeneous, must be smelted in order to assay them and estimate upon their value. The refining and other dues apply only to pieces to be coined. Foreign coins are exempted from the provisions of section 1, above mentioned, and will only be subject to the payment of coinage dues, as provided in sections 3 and 4, above mentioned, when they are introduced into the mints to be coined.

The present monetary system of México is regulated by the law of November 28, 1867,¹ which introduced the decimal monetary system in the country. The preamble of this law states its object to be to establish a uniform system of currency without making any essential modifications in the value of the monetary unit, which shall remain the silver dollar (*peso*). This dollar is to weigh 27.073281 grams, and be of a fineness of 0.902 plus (0.777 of 0.001). The weight of this dollar is, expressed in grains troy, 417.79. The amount of pure silver in the dollar is 377.139 grains troy. The variation allowed at the mints in the weight is 750 grains either way for each \$1,000, and the maximum for each dollar is $1\frac{1}{2}$ grains.

The weights of all the silver coins are given below:

Silver coins, <i>a</i>	Weight in grams.	Equivalent in grains.
\$1	27.073281	417.79
50-centavo	13.536	208.90
25-centavo	6.768	104.45
10-centavo	2.707	41.77
5-centavo	1.352	20.865

a By a law passed in December, 1897, the mints commenced, in January, 1898, to coin a new *peso* and a 20-centavo piece. The *peso* is of the same weight and fineness, but bears different inscriptions from those on the old 8-real peso. A bronze centavo was created by decree of December 21, 1899, containing 95 parts of copper, 4 parts of tin, and 1 part of zinc.

The fineness of gold coins is 0.875. The denominations and weights are given in the following table:

Gold coins.	Weight.
	<i>Grams.</i>
\$20.	33.841
\$10.	16.920
\$5.	8.460
\$2.50.	4.230
\$1.	1.692

¹ Leyes y disposiciones relativas á la Moneda Nacional—1821-1899—Secretaría de Estado y del Despacho de Hacienda y Crédito Público—México—1900.

The ratio of coinage is $16\frac{1}{2}$ to 1.

There seems to be practically no gold in circulation in the Republic, the best informed authorities estimating the amount between \$75,000 and \$100,000.

There are in the Republic 18 banks of issue, but their paper is not legal tender, it being covered by large deposits of coin. The Government issues no paper money and, as a rule, does not retain any specie in the Treasury vaults, the National Bank, which acts as depository, paying all warrants, etc.

On June 30, 1899, the leading banking institutions of the country held in cash¹ \$48,361,213.55, while the amount of bills in circulation was \$58,208,340.75, the authorized capital of these institutions being \$55,360,000 and the unsubscribed capital \$16,290,000. The general condition of these banks on the date in reference is shown as follows:

Assets.

Unsubscribed capital	\$16, 290, 000. 00
Cash	48, 361, 213. 55
Bills receivable.....	69, 233, 714. 21
Loans on personal property	22, 807, 662. 82
Hypothecary loans	7, 170, 516. 54
Loans on real estate	2, 592, 896. 67
Public funds held by the banks	464, 240. 00
Current debt or accounts.....	42, 960, 908. 63
Furniture and fixtures.....	1, 083, 832. 11
<hr/>	
Total	210, 964, 984. 53

Liabilities.

Authorized capital.....	\$55, 360, 000. 00
Bills in circulation.....	58, 208, 340. 75
Mortgage bonds in circulation.....	6, 546, 600. 00
Sight deposits.....	1, 552, 272. 49
Other deposits	3, 122, 549. 46
Current credit accounts	75, 765, 661. 70
Increase of capital and reserve fund (provisional) ²	2, 503, 812. 50
Reserve fund	4, 712, 615. 00
Surplus fund.....	3, 193, 332. 63
<hr/>	
Total	210, 964, 984. 53

¹ By order of the Treasury Department, 1897, banks were forbidden to count as cash on hand notes of their own or other banks, so that the term "cash on hand" represents actual specie.

² Bank of London and Mexico.

The following table shows the banks of issue of the Republic on June 30, 1899, their authorized capital, unsubscribed capital, cash on hand, and bills in circulation:

Banks.	Capital.	Bills in circulation.	Unsubscribed capital.	Cash.
Banco Nacional de México	\$20,000,000.00	\$23,211,265.00	\$10,000,000.00	\$24,748,366.46
Banco de Londres y México	10,000,000.00	19,790,269.00	.....	11,524,632.88
Banco Internacional e Hipotecario <i>a</i> ..	5,000,000.00	.....	1,500,000.00	783,316.45
Banco Minero de Chihuahua	1,500,000.00	1,812,140.75	.....	1,074,189.87
Banco Comercial de Chihuahua	600,000.00	446,249.00	.....	254,058.77
Banco Yucateco	1,250,000.00	3,637,280.00	.....	2,205,654.95
Banco Mercantil de Yucatán	750,000.00	1,473,787.00	.....	912,148.69
Banco de Durango	1,000,000.00	431,549.00	.....	367,639.68
Banco de Nuevo León	960,000.00	1,182,865.00	.....	623,430.45
Banco de Zacatecas	600,000.00	543,271.00	240,000.00	663,130.41
Banco del Estado de México <i>b</i>	1,500,000.00	426,590.00	750,000.00	276,817.29
Banco de Coahuila <i>b</i>	1,600,000.00	1,026,580.00	.....	684,124.08
Banco de San Luis Potosí <i>b</i>	1,100,000.00	834,250.00	550,000.00	597,542.12
Banco de Sonora <i>b</i>	500,000.00	740,000.00	.....	463,979.82
Banco Occidental de México <i>b</i>	500,000.00	98,925.00	250,000.00	290,481.13
Banco Mercantil de Veracruz <i>b</i>	2,000,000.00	2,216,560.00	.....	1,378,771.42
Banco de Jalisco <i>b</i>	500,000.00	336,760.00	.....	268,325.19
Banco Central Mexicano <i>b</i>	6,000,000.00	.....	3,000,000.00	1,244,603.89
Total	55,360,000.00	58,208,340.75	16,290,000.00	48,361,213.55

a This bank issues only guaranteed bonds.

b These banks have been established since the passage of the banking law of March 19, 1897.

The three principal banks of the Republic are: The National Bank of México, a stock company, with twelve branch offices at Chihuahua, Durango, Guadalajara (Jalisco), Guanajuato, Mazatlán (Sinaloa), Mérida (Yucatán), Monterey (Nuevo Leon), Oaxaca, Puebla, San Luis Potosí, Veracruz, and Zacatecas; the International and Mortgage Bank, a limited stock company, having a board of directors in the City of México and another in New York (United States), and the London and México Bank, also a stock company, with branch offices in Guadalajara, Guanajuato, Mazatlán, Morelos, Puebla, Querétaro, San Luis Potosí, and Veracruz.

The oldest banking institution of México is the Monte de Piedad (National Pawn Shop), which was established in 1775, with a capital of \$300,000, given by Don Pedro Romero de Terreros. Formerly it possessed the authority to issue notes, but this authority has been revoked and all the notes redeemed. It is in reality a charity, the business of which amounts to over \$1,000,000; distributed among 60,000 borrowers.

The Bank of London and México commenced its operations in the Republic under the name of the Bank of London, México, and South America, without a Federal concession. This was not necessary according to the law then in force. When, in 1884, owing to the commercial code, it became necessary to obtain such a concession, that of the Employees' Bank was transferred to it with modifications. In 1889 a new contract was executed, changing the name to the Bank of London and México, and further modifying the contract of 1886.

The Mexican National Bank was established in 1881, the contract being modified in 1884, when permission was granted to combine with

the Mercantile Mexican Bank and change the name of the institution to National Bank of México.

The Mortgage Bank (Banco Hipotecario) was established by virtue of a concession bearing date of May 22, 1882, and modified in August, 1888, when its name was changed to that it now bears (International and Mortgage Bank of México) and its capital increased.

The existing banks are prosperous and in a flourishing condition, but the demand for increased facilities are such that new banks are being established and the operations of the old ones increased and extended in various directions.

The privilege of issuing bank notes or bills on demand in the Federal District is confined to the Bank of London and México and the National Bank. Though this privilege is also granted to the banks to be established in the States of the Republic, they will not be permitted officially to establish redemption agencies for their notes in the capital, and it will be a long time before the bills of the States' banks occupy the same position in the public confidence as those issued at the capital, though they are now circulating more freely. There are a great many private banking houses in the City of México and elsewhere, which have a high standing and do an excellent business. During the last fiscal year an American bank has been established at the capital, which seems to be flourishing.¹

Doubtless before a great while every State of the Republic will have at least one bank, as the banking law now in force offers certain advantages to pioneer State banks. This will also facilitate the transaction of business, doing away with the extraordinary charges that have been prevalent, especially when life and property were not as safe as they are at present. Drafts can now be drawn on many distant points at a slight expense, and competition is reducing even this charge.

Bank failures are unknown in México. The Government has an inspector attached to each bank, whose duty it is to exercise a strict supervision over the issuance of bank notes, and other operations of the notes being dependent upon his signature.

The security required by Mexican banks is of such a nature and the formalities so difficult that but few American houses can comply with them, consequently the extension of American interests is not so rapid as it should be. The bills issued by banks of issue are regulated strictly by law. It is not the custom in México to make large deposits in the banks, not for lack of confidence, however, but it is claimed that the stamp tax on checks and drafts has much to do with this.

The usual rate of interest charged varies from 6 to 8 per cent, only outside brokers and professional money lenders obtaining more, and

¹Commercial Relations of the United States, 1898, vol. 1, p. 514. Report of Consul-General Barlow, November 23, 1898.

this on security that the banks would probably not accept, as they are very conservative. All accounts are kept in Mexican currency and the principal banks have accounts in New York, London, Paris, and Berlin.

The Bank of Chihuahua, formed by capitalists of that city, is a *banco refaccionario*, the first of its kind to be organized in the Republic, and entering a different field from those now in existence. It is destined to be an important addition to the banking facilities of the city, as it is authorized to issue certain classes of securities other than bank notes. The principal provisions of the concession are that the name of the bank shall be "Banco Refaccionario Mexicano," its capital in shares at the time of the concession \$1,000,000, and its domicile the City of México. The bank may establish four branches at such cities as may be deemed expedient, previous authorization being obtained from the Department of Finance, the capital to be increased at the rate of \$100,000 for each new branch. To guarantee the establishment of the bank, a deposit of \$100,000 in 3 per cent consolidated debt bonds shall be made in the General Treasury of the Federation, said deposit to be returned to the bank as soon as it begins operations. From March 19, 1897, the bank is to enjoy, during twenty-five years, all the exemptions and franchises granted by the general banking law, and any transfer of the concession not expressly approved by the Department of Finance shall be null and void, except as provided by law. The concession is to last for forty years from the above date, the loans made by the bank not to exceed in the aggregate the amount of capital stock actually paid up and the bonds which it may have in circulation, in accordance with the provisions of the general banking law. Further, the bank can not transact loan and discount operations running for more than six months not guaranteed by two responsible parties other than those provided by law.

The amount of bonds which the bank may put into circulation shall never exceed five times the capital actually paid up, nor may it at any time exceed the amount of specie and bullion which the bank holds in its vaults, added to the value of the immediately negotiable securities which it has on hand. For this purpose the following are held to be immediately realizable or negotiable securities:

"Commercial notes running for a period of time which shall not exceed the term of the bonds issued as a consequence of the transaction or transactions that have been performed.

"Mortgage bonds issued by banks or by mercantile corporations.

"Bonds of the Mexican Government.

"Bonds or any other securities, provided that they are quoted on one or other of the home markets or in the bourses of London, Paris, Berlin, or New York, and provided they have paid dividends or interest with entire regularity for at least two years prior to the date on which they are acquired by the bank."

During the first five years from the date on which it opens for business the bank shall enjoy entire freedom of action as to the minimum amount of bonds which it shall circulate, but after that period the bank must maintain constantly in circulation an amount which shall at least be equal to its paid-up capital, if the latter does not exceed \$500,000; and if the capital exceeds that sum, the amount of bonds in circulation must be 50 per cent of such capital, with the proviso, however, that the total of the bonds shall not be less than half a million dollars. At any time subsequent to the period of five years above mentioned when the bonds outstanding do not amount to the required figure during one hundred and eighty consecutive days, or during one hundred and eighty days, even though interrupted, if within a period of one year, the bank shall, even though it is to continue doing business, cease to enjoy the franchises in the matter of taxation granted by the general banking law, after an announcement to that effect has been made by the Department of Finance and the bank has been heard in its defense.

The bank can not issue certificates of deposit payable at sight to bearer. The bonds which the bank may put into circulation shall set forth the time in which they are to be paid, and also the rate of interest which they bear. They shall be of \$100, \$500, and \$1,000 denominations, and payable both to bearer and to given individuals by name. They shall have coupons for the payment of interest when the time for which they are to run exceeds six months, and the form or model according to which they are to be printed shall be submitted for approval to the Finance Department.

The principal and interest represented by the bonds in circulation shall enjoy with respect to payment, over all other claims, the same preference as is granted to bank notes by article 25 of the general banking law.

The bank may not pledge its bonds or the notes it has discounted as security.

Neither officers nor employees of the Federal Executive may be members of the council of administration nor managers of the bank or its branches. This prohibition applies to functionaries and employees of the executive department of the States in which the bank may establish branches.

In order to compensate the Government for the expense of supervision, the bank shall hand over in quarterly installments, in advance and in cash, the sum of \$3,000 per year.

Any controversy that may arise with the Mexican Government in regard to this contract shall be submitted to the decision of the Federal tribunals of the Republic, with the exception of such cases as, according to the law, have to be settled by administrative action.

The general law for the establishing of banks, passed on June 3, 1896, provides that the Executive of the Union is authorized to issue

the general law by which the concession, establishment, and operations of banks of issue in the States of the Republic are to be governed, subject to the following provisions:

1. No concession shall be granted without the deposit by the concessionaires of bonds of the national public debt whose nominal par value shall be at least equal to 20 per cent of the sum which the bank is to have in cash in order to begin operations.

2. The minimum capital subscribed shall be \$500,000, of which at least half shall be paid in cash before the bank begins operations.

3. The cash balance in each bank shall never be reduced to less than half the amount of its circulation notes and the amount of deposits payable on demand, or at three days' sight, or less.

4. No bank shall be authorized to issue circulation notes for a sum greater than three times the amount of its paid-up capital.

5. The bank notes may be accepted as currency and shall not be of a lower denomination than \$5.

6. Exemptions or rebates from taxes shall only be allowed to the bank first established in any of the States or Federal Territories of the Republic. All other banks shall pay the taxes imposed by the general laws, and, furthermore, a special tax to the Federation of 2 per cent per annum upon the amount of their paid-up capital. For the purposes of this section, first banks shall be considered such as are now established, provided they subject themselves to the provisions of the general law.

7. Banks established in a State shall not have beyond the same branch offices for the conversion of their notes, save by special permission from the Executive, who will grant the same only when close business interests bind several States, but never for the establishment of said branch offices in the City of México or in the Federal District.

8. The Federal Executive shall have at the banks an interventor, whose duties shall be specified and who, at the revision of the annual balances, shall have the same authority granted by law to the commissaries of corporations.

9. Banks shall publish a monthly balance sheet, which shall show, besides the balances of accounts required by law, the cash on hand, amount of bank notes in circulation, and amount of deposits payable on demand or at three days' sight, or less.

10. No concessions shall be granted by the Executive of the Union until after the promulgation of the general banking law and in conformity with its provisions.

The Executive is likewise authorized:

1. To enter into agreements with the National Bank of México, pursuant to which, and through such compensation as may be deemed equitable, all variances between the concession of said bank and the promulgation of the general law referred to in the foregoing article shall be removed.

2. To enter into agreements with banks already existing pursuant to special concessions, provided that State banks, in order to enjoy the benefits of the general law, shall relinquish the concessions under which they were established.

3. The authority granted the Executive by the present article to enter into agreements with the State banks shall cease six months after the publication of the general law, and that granted for other purposes shall terminate on the 15th of next September.

The regulations which are to govern all other institutions of credit may be the subject of the said law or of other special laws that the Executive may issue as he may deem best.

4. The Executive will report to Congress, with respect to his action under the authority conferred upon him by this law, at the session next following the publication of the decree or decrees in the premises.

Pursuant to the authority in him vested by this law, the President, on March 19, 1897, promulgated the "General Law relating to institutions of credit," the main features of this law are as follows:

For the purposes of the law, the following only are considered as institutions of credit: Banks of issue, mortgage banks, and loan (*refaccionarios*) banks.

Banks of issue are such as issue notes of a given value, payable at par, at sight, and to bearer.

Mortgage banks are such as make loans secured by mortgage on urban or suburban real estate, and issue bonds secured in like manner, bearing interest and payable under given circumstances at fixed dates.

Loan banks are such establishments as are intended to facilitate mining, agricultural, and industrial operations by means of privileged advances, unsecured, assuming liability for determinate operations, and issuing bonds promptly maturing, bearing interest, and payable on a day certain.

Credit institutions can only be established under a special concession granted by the Executive in conformity with the requirements and conditions of this law and the act of June 3, 1896.

Concessions for the establishment of institutions of credit may be granted to private individuals or corporations, but business operations under such concessions can only be conducted by corporations duly constituted in the Republic.

Concessions to private parties shall be granted to three persons at least, who must prove, within the succeeding three months, the incorporation of the association which is to operate under the concession and the assignment of the latter thereto.

Corporations of this kind are governed by the commercial code whereinssoever it does not conflict with the following provisions:

1. The number of corporators shall be seven, at least.
2. The corporate capital shall never be less than 500,000 *pesos* in the

case of banks of issue and mortgage banks, nor less than 200,000 in the case of loan banks.

3. Express authority of the Department of the Treasury is necessary to increase or reduce the corporate capital.

4. No incorporation may be effected unless the corporate capital is fully subscribed and the 50 per cent thereof payable in cash paid in.

5. The domicile of the corporation shall be the place in the Republic where the principal office is located.

6. Certificates of shares may be in the names of individuals until their value shall be fully paid in.

7. The reserve fund shall consist of 10 per cent of the net annual profits until it shall equal a third part or more of the aggregate corporate capital.

In no case shall the duration of the concessions exceed thirty years, reckoned from the date of this law, for banks of issue, and fifty years for mortgage and loan banks. Foreign banking institutions issuing notes payable to bearer can not maintain branches or agencies in the Republic for the issue and payment of the same.

The articles of incorporation and by-laws of all corporations referred to in this law shall be submitted for approval to the Department of the Treasury before the bank opens for business.

Banks of issue may be established and operate in the States and Territories subject only to the provisions of this law. Such banks in the Federal District will continue to be governed by existing contracts and provisions.

Bank notes of the denominations of 5, 10, 20, 50, 100, 500, and 1,000 *pesos* only shall be placed in circulation.

The notes must express in Spanish the obligation to pay in cash at par, at sight, and to bearer the face value thereof. The date of issue, series, and number of the note, as well as the signatures of the Government interventor, one of the directors, and of the manager or cashier of the same, must also appear.

Bank notes bear no interest and are imprescriptible during the life of the institution. The obligation to pay shall lapse by limitation five years after the bank is declared in bankruptcy or it shall go into liquidation.

Banks of issue are prohibited from—

1. Making loans or discounting or negotiating securities when the date of maturity exceeds six months.

2. Discounting promissory notes or other commercial paper without two responsible indorsements at least, or without collateral security.

3. Making loans secured by mortgage, save in the cases mentioned below.

4. Pledging or depositing their notes and contracting any obligations thereby.

5. Mortgaging their property or pledging their discounted paper.

Banks of issue may only accept security by way of mortgage when the credit of any of the responsible indorsers of discounted paper shall have suffered loss, and when the Department of the Treasury shall expressly authorize the same.

No individual or corporation not authorized thereunto by the provisions of this law may issue any promissory note or paper containing a promise to pay in cash, to bearer, at sight.

Mortgage banks may make loans secured by mortgage as follows:

1. Short-time loans bearing simple interest payable on a day certain.
2. Long-time loans, reimbursable in annual payments to include interest, reduction on principal, and remuneration to the bank.

Short-time loans are such as are payable in one or more installments, but always in less than ten years.

With respect to loans reimbursable in annual payments, the number of such payments shall not be less than ten nor more than forty should the same be made in quarterly, semiannual, or annual installments.

The bank's mortgage should always have priority, either because the real estate has no other mortgage attaching to it, or because, if previously mortgaged, preference be given the new loan through subrogation or pursuant to the express consent of the preferred creditors, or through any other means authorized by law.

Mortgage loans shall never exceed one-half the value of the property mortgaged, to be appraised by experts named by the bank, unless an appraisal for taxation, made in due form of law, exists, in which case the Department of the Treasury may authorize banks to act upon such appraised valuation.

Only such urban or suburban real estate as is situated within the States, Federal District, or Territories where the principal office or branch offices of the bank are located shall be the subject of mortgages.

Property held under certain titles may not be mortgaged to secure loans.

Banks can not make secured loans on mines, forests, temples, nor real estate specially devoted to some public service of the Federation, States, or municipalities.

The aggregate amount of sums loaned and secured by mortgage shall at no time exceed twenty times the paid-up capital of the loaning bank, nor shall the sums loaned any individual or association exceed the one-fifth part of such capital.

Moneys due by debtors in payment of installments on the principal, or for interest, can not be withheld or in any way restrained by law or otherwise.

The nominal value of the mortgage bonds these banks are authorized to issue shall never exceed the aggregate amount of secured loans.

These bonds shall bear such interest as the board of directors of the banks may determine.

The bonds shall be of the denominations of 100, 500, and 1,000 *pesos*,

respectively, and assignable by simple transfer if payable to bearer, or by indorsement if payable to order.

Mortgage bonds may be issued either without date of maturity or payable on a day certain. The former shall be taken up through drawings.

There shall be two drawings at least in every year, and at each drawing there shall be taken up the number of bonds that may be necessary in order that the nominal value of those still in circulation shall in no case exceed the aggregate amount of the secured loans of the bank.

Within eight days after the drawings the numbers of the bonds drawn shall be published, as also the date upon which they should be presented for payment. These bonds shall cease to bear interest from the date designated for their payment.

The banks may provide for extra drawings should they see fit. Bonds so paid shall be canceled and destroyed.

Mortgage banks shall keep on hand at all times a special guarantee fund in cash, which shall always be greater than the semiannual interest on the bonds in circulation.

Besides making loans secured by mortgage and issuing bonds, mortgage banks are authorized to engage in the operations following:

1. To invest in their own bonds and in other first-class securities.
2. To make loans for not more than six months, secured by such securities as collateral.
3. To receive deposits, paying, or not, interest thereon.
4. To draw, buy, sell, and discount bills of exchange, drafts, orders, or checks, payable in the Republic or abroad at a date not to exceed six months.
5. To sell, buy, or collect on commission, directly or through agents, all kinds of securities.
6. To loan, with proper security, the mortgage bonds deposited as security.
7. To make loans or advances for public works or improvements, entering into the necessary contracts for the purpose with the Federal, State, and municipal governments.

Mining stock certificates are expressly excluded from the securities in which the banks are allowed to invest.

Banks may receive deposits only to an amount not greater than five times the paid-up capital; and they are bound to keep on hand at all times in cash, gold or silver bullion, or immediately convertible securities, an amount equal to two-thirds, or more, of the aggregate deposits.

Loans made to the Federal, State, and municipal governments must be secured by mortgage on real estate, lien on taxes specially levied, or by the securities issued to raise the funds necessary to execute the public works referred to.

Mortgage banks are prohibited from issuing bank notes, or any other security payable on demand to bearer.

The concluding sections treat of the legal steps to be taken to foreclose mortgages, and exempt banks of this kind from furnishing the bonds required in legal proceedings.

Loan banks are authorized to engage in the operations following:

1. To make cash loans, payable within two years, to mining, industrial, and agricultural enterprises.

2. To pledge their responsibility in order to facilitate the discounting or negotiating of promissory notes or obligations maturing not later than six months after date.

3. To issue bonds payable in coin, bearing interest and maturing in not less than three months nor more than two years after date.

The law gives banks of this kind a first lien on all mines, products, crops, live stock, machinery, tools, agricultural implements, etc., which may be pledged to the payment of a loan.

The value of the coin bonds issued by loan banks shall never exceed the amount on hand in cash or in bars of the precious metal, plus the value of immediately convertible securities held as bills collectible.

These banks are prohibited:

1. From issuing bank notes.

2. From engaging in mortgage operations and from issuing mortgage bonds.

3. From working on their own account mines, reduction works, industrial establishments, or agricultural estates, and from entering into any open association, or as silent partners, with parties representing such enterprises.

Banking institutions are prohibited from acquiring real estate under any title whatsoever, other than that necessary for the establishment of their offices and dependencies, and such as may be adjudicated to or received by them in the collection of their debts or in the exercise of the rights incident to the operations in which they engage. The real estate adjudicated and received as above must be conveyed away within three years, in the case of mortgage banks, and within two years in the case of loan and issue banks. At the expiration of such terms without any conveyance, the Department of the Treasury shall order a public sale of the real estate.

Banking institutions shall not buy their own stock nor engage in any operation requiring it for security.

The consolidation of two or more banks can not be effected without the previous approval of the Department of the Treasury.

Banking institutions must publish a monthly balance sheet showing at least the information following:

Under assets:

1. Uncalled capital.

2. Cash on hand.
3. Notes discounted.
4. Loans on collateral.
5. Loans on mortgage.
6. Investments in public securities and immediately convertible paper.

7. Accounts current, debtor.
8. Real estate belonging to the bank.

Under liabilities:

1. Capital.
2. Circulation.
3. Deposits.
4. Accounts current, creditor.
5. Reserve and precautionary funds.

The Department of the Treasury shall publish a yearly statement of the condition of the banking institutions of the Republic.

The last chapter of the law treats of franchises and taxes. It provides that the capital of banking institutions, the shares representing the same, dividends paid to shareholders, and the several kinds of securities issued by them are exempt from every manner of taxation, Federal, State, and municipal, save the real-estate tax on the buildings occupied by them for office purposes and the stamp tax. There are, however, numerous exemptions from this latter burden.

Since the publication of the foregoing law the Treasury Department has entered into a contract with each of the State banks formerly established, in which the banks waive the rights acquired under their original concessions and subject themselves to the requirements of the new law, thereby enjoying the privileges accorded to the first bank instituted in each State. Each of the banks has five years within which to call in its notes of a denomination less than 5 *pesos*.

CHAPTER XIV.

MEANS OF COMMUNICATION.

RAILROADS AND RAILROAD LAW—TELEGRAPH AND TELEPHONE LINES—
STEAMSHIP LINES—POSTAL SERVICE.

Notwithstanding earnest endeavors to foster railroad construction in México, for many years the topographical conditions of the country rendered such enterprises both difficult and expensive. Means of communication were limited to a few wagon roads, over which twenty-four regular lines of diligences were operated under one management, supplemented by a few bridle paths, leading from the Central Plateau over the Sierras to points on the Pacific and Gulf coasts.

In 1854 the first section (about 4 kilometers in length) of what afterwards became the Mexican Railway was finished, connecting the City of México with Guadalupe, and, with another line, about 19 kilometers long, between Veracruz and Tejería, constituted the railways of the Republic until 1861. The French army, during the war of intervention, in 1862, carried the Tejería section as far as Paso del Macho, at the foot of the mountains, a distance of about 56 kilometers. About the same time an English syndicate, which had a concession from the Government to build a road from the capital to Veracruz, extended the Guadalupe road to Puebla, the entire line to Veracruz being completed in 1873. It is from this period that the era of railroad development in México dates, new impetus being given to this branch of public service by the installation of General Díaz as President, in 1876. From 1877 to 1882 México built more miles of railroad than any other Latin American country, the average yearly construction during that period being 689 kilometers.¹

In his message to Congress, April 1, 1897, President Díaz, in referring to the extent of railway development in the Republic, states that in 1875 there were 578 kilometers 285 meters of road; in 1886, 5,915; in November, 1888, 7,940; in June, 1892, 10,233, or, including the tramways and other local private lines, 11,067 kilometers; in September, 1894, 11,100, and in April, 1897, the total extent amounted to

¹ Informe del C. General Porfirio Díaz, Presidente de los Estados Unidos Mexicanos, á sus compatriotas, 1896.

11,469 kilometers. The same document also gives the following figures in regard to traffic:

	1876.	1890.	1893.	1895.
Number of passengers.....	4, 281, 327.	19, 531, 395	22, 781, 343	24, 269, 895
Freight handled (tons)	132, 915	2, 734, 430	3, 798, 360	4, 798, 360
Gross receipts	\$2, 564, 870	\$21, 019, 960	\$26, 121, 624	\$28, 758, 450

It is also stated that the subsidies paid for railroads up to December, 1892, averaged \$8.935 per kilometer built and in operation at that date, and up to June 30, 1896, the total amount paid in subsidies reached \$107,743,660.25, distributed as follows:

Paid in cash	\$46, 896, 901. 95
Certificates of construction (convertible into 5 per cent bonds).....	21, 711, 513. 92
Paid in bonds.....	31, 127, 000. 00
Balance, payable either in cash or bonds.....	8, 008, 244. 38

Taking into consideration that in the \$31,127,000 paid in bonds, \$13,500,000 are included which were paid in gold to the contractors of the Tehuantepec Railway at 100 per cent premium, such sum must be regarded as \$27,000,000 silver, thus increasing the former total to \$121,343,660.35 silver.¹

Most of the railways built in México have obtained large subsidies from the Government, ranging from \$6,000 to \$10,000 per kilometer, according to the difficulties of the work, these subsidies having contributed very largely to the prosperous condition of the roads, as the proceeds have been used not only to build the line, but in some cases to pay the interest on bonds.

At present the railroad system of the Republic connects the capital with the principal centers of population, commerce, and production; also with some of the more important seaports of the Republic and with the United States. The Tehuantepec road, formerly owned and operated by the Government, is the only line connecting the Pacific and Gulf coasts. Lines traversing the central plateau as far as the United States frontier connect the City of México with the capitals of Querétaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Chihuahua, and San Luis Potosí, over the Central Railroad, while the International road connects it with Durango; the National line with México (Toluca), Guanajuato, Michoacán, San Luis Potosí, Coahuila, and Nueva Leon; the Mexican International with Puebla and Veracruz (via Orizaba and Jalapa), and the Southern Mexican with Puebla, Tlaxcala, and Oaxaca. The port of Manzanillo is connected with the capital of Colima; the port of Matamoros with Reynosa and San Miguel, in Tamaulipas; Tampico with San Luis Potosí and Monterey, and the Tehuantepec

¹ "Los Estados Unidos Mexicanos, sus progresos en veinte años de paz, 1877-1897." Rafael de Zayas Enriquez, New York, p. 195.

line connects Coatzacoalcos on the Gulf with Salina Cruz on the Pacific. The International in its southern extension passes near Cuernavaca (Morelos) and the Cuernavaca and Pacific road runs to Igualá (Guerrero) and will soon connect with Acapulco on the Pacific. Mérida on the Yucatán Peninsula is connected by rail with Progreso and Campeche.

The slopes on the Pacific side of the great central table-land present much greater engineering difficulties than those on the east or Gulf side, hence the slow development of means of communication in the former section.

According to the latest available statistics from México, the number of kilometers of railroad on December 31, 1897, was as follows:

	Meters.
Railroads under Federal grants.....	11,526,852
Tramways.....	471,012
Suburban lines under State grants.....	380,470
Railroads belonging to private parties.....	421,754
Portable railways, Decauville system.....	884,855
Total.....	13,684,943

The following tables show the name of the railroads, date of concession, and number of kilometers built for all the roads operating under Federal grants on December 31, 1897:

[S. stands for standard gauge and N. for narrow gauge.]

Name of railroad.	Date of concession.	Number of kilometers built on all lines.
		<i>Meters.</i>
Ferrocarril Mexicano and Ometusco á Pachuca (S.).....	Nov. 27, 1867	516,500
Ferrocarril de Mérida Progreso (S.).....	Jan. 17, 1874	36,456
Ferrocarril del Distrito Federal (S.).....	July 21, 1882	106,420
Ferrocarril de Hidalgo y Nordeste (N.).....	Feb. 2, 1878	209,700
Ferrocarril de Veracruz á Alvarado (S. and N.).....	Nov. 26, 1878	70,410
Ferrocarril de Mérida á Peto (N.).....	Nov. 27, 1878	118,000
Ferrocarril Interoceánico (N.).....	Apr. 16, 1878	900,070
Ferrocarril Occidental de México (S.).....	Aug. 16, 1880	61,927
Ferrocarril Central Mexicano (S.).....	Sept. 8, 1880	3,159,363
Ferrocarril Nacional Mexicano (N.).....	Sept. 13, 1880	1,691,150
Ferrocarril de la Compañía Constructora Nacional Mexicana (N.).....	do.....	142,000
Ferrocarril de Sonora (S.).....	Sept. 14, 1880	422,302
Ferrocarril de Mérida á Valladolid, and branch to Progreso (N.).....	Dec. 15, 1880	115,688
Ferrocarril de Tlalmanalco (N.).....	Feb. 3, 1881	26,680
Ferrocarril de Nérída á Campeche (N.).....	Feb. 23, 1881	184,375
Ferrocarril de Campeche á Lerma (N.).....	do.....	6,000
Ferrocarril Internacional Mexicano (S.).....	June 7, 1881	1,061,510
Ferrocarril de Nautla á San Marcos (N.).....	June 25, 1881	79,000
Ferrocarril de San Juan Bautista al Carrizal (N.).....	Sept. 17, 1881	5,750
Ferrocarril de San Andrés Chalchicomula (S.).....	Sept. 20, 1881	10,353
Ferrocarril de Orizaba al Ingenio (S.).....	Sept. 22, 1881	7,550
Ferrocarril de Santa Ana á Tlaxcala (S.).....	Dec. 11, 1882	8,500
Ferrocarril de Cárdenas al Río Grijalva (N.).....	May 12, 1883	7,500
Ferrocarril de Toluca á San Juan de las Huertas (N.).....	May 25, 1883	15,721
Ferrocarril de Vanegas á Río Verde (N.).....	June 11, 1883	66,855
Ferrocarril de Tehuacán á Esperanza (S.).....	Nov. 28, 1883	50,000
Ferrocarril de Mérida á Izamal (S.).....	May 15, 1884	65,848
Ferrocarril de Chihuahua al Pacífico (S.).....	Nov. 13, 1884	11,000
Ferrocarril de Mexicano del Sur (N.).....	Apr. 21, 1886	366,600
Ferrocarril de Baja California (S.).....	May 25, 1887	27,000
Ferrocarril de Monterey al Golfo (S.).....	Nov. 10, 1887	624,640
Ferrocarril de Tecolutla al Espinal (N.).....	Dec. 10, 1887	25,850
Ferrocarril de Córdoba á Tuxtepec (S.).....	May 19, 1888	51,000
Ferrocarril de Pachuca á Tampico (S.).....	June 5, 1888	20,000
Ferrocarril de Michoacán y Pacífico (N.).....	Aug. 16, 1888	90,291

Name of railroad.	Date of concession.	Number of kilometers built on all lines.
		<i>Meters.</i>
Ferrocarril de Salamanca al Jaral (N.)	Aug. 30, 1888	35,500
Ferrocarril de Monte Alto (N.)	do	10,000
Ferrocarril de Veracruz á Boca del Río (N.)	Aug. 31, 1888	11,504
Ferrocarril de Nacional de Tehuantepec (S.)		309,677
Ferrocarril de Industrial de Puebla (S.)	July 2, 1889	39,459
Ferrocarril Minero (S.)	May 20, 1890	130,200
Ferrocarril México, Cuernavaca y el Pacífico (S.)	May 30, 1890	159,386
Ferrocarril Carbonífero de Oaxaca (N.)	Apr. 20, 1891	20,000
Ferrocarril Toluca á Tenango (N.)	Nov. 24, 1891	25,000
Ferrocarril Zavaleta á San Rafael (N.)	Mar. 24, 1892	4,000
Ferrocarril Esperanza al Xuchil (S.)	Nov. 29, 1892	25,500
Ferrocarril Guanajuato á Dolores Hidalgo y San Luis de la Paz (N.)	May 24, 1893	20,000
Ferrocarril Celaya á las Haciendas de "Roque" y "Plancarte" (N.)	June 2, 1893	14,600
Ferrocarril Compañía á la Hacienda de Zoquiapam (N.)	June 3, 1893	8,317
Ferrocarril Cazadero á Solís (S.)	May 24, 1893	30,000
Ferrocarriles Industriales (S.)	Dec. 18, 1895	3,000
Ferrocarril Ciudad Juárez á Corralitos (S.)	Mar. 24, 1896	250,000
Ferrocarril Torres á Minas Prietas (N.)	May 28, 1897	22,000
Ferrocarril Jalapa á Teocelo (N.)	June 3, 1897	17,000
Ferrocarril Jalapa á Córdoba (N.)	Dec. 5, 1895	29,700
Total		11,526,852

The other railways in the Republic were:

States.	Tramways.		Suburban lines, State grants.		Private railways.		Portable railways.	
	Number.	Meters.	Number.	Meters.	Number.	Meters.	Number.	Meters.
Aguas Calientes	1	1,120			1	5,170		
Campeche	2	4,887	1	40,000	1	13,000	8	26,000
Coahuila	1	6,250	1	6,100	2	5,100	3	1,650
Colima	1	3,000	1	4,000	1	1,012		
Chiapas			1	50,000				
Chihuahua	2	4,569						
Durango	2	14,300						
Guanajuato	6	36,463	1	36,000			9	12,893
Guerrero							1	1,252
Hidalgo	1	8,845						
Jalisco	5	23,172	5	46,731				
México	2	30,600			10	109,901		
Michoacán	2	8,941	1	4,000	1	14,100		
Morelos					4	7,870	1	18,000
Nuevo Leon	2	35,983	2	20,303	3	53,000		
Oaxaca	1	1,500						
Puebla	1	30,000			4	28,022	8	77,460
Querétaro	2	12,040	1	9,000	1	314		
San Luis Potosí	3	24,900	1	11,000	3	17,500	1	1,000
Sinaloa	1	4,042			1	2,133	3	14,252
Sonora	1	3,203	1	21,000	1	16,000		
Tabasco	1	2,400	1	6,200			10	12,700
Tamaulipas	4	10,863						
Tlaxcala			2	13,586	4	26,896		
Veracruz	5	33,950	2	19,550			1	1,000
Yucatan	2	32,694	3	44,000	12	82,260	171	718,668
Zacatecas	1	8,950	2	49,000				
Federal District	2	104,987			5	3,476	2	6,700
Baja California					2	36,000		
Tepec	1	1,000						
Total	52	458,812	26	380,470	56	421,754	118	884,855

The principal railroads in the country are controlled by corporations, a brief sketch of each being subjoined.

The Mexican Railway (*Ferrocarril Mexicano*) was, as already stated, the first road constructed in the Republic, having been begun in 1857 and portions of the line being opened to the public at different

times. The Puebla branch was inaugurated in 1869, the main branch being opened for its entire length in 1873 and the Ometusco-Pachuca extension in December, 1890. The total length of the line is 516 kilometers 500 meters, as follows: México to Veracruz, 423 kilometers 750 meters; Apizaco to Puebla, 47 kilometers, and from Ometusco to Pachuca, 45 kilometers 750 meters. It is a standard-gauge road, and runs through the States of Veracruz, Puebla, Hidalgo, and México, starting at the city of Veracruz and passing through the towns of Córdoba, Orizaba, Puebla, and Pachuca, its terminal point being the City of México. It is considered one of the most beautiful and picturesque railway lines in the world, passing as it does from tropical vegetation of the valleys to the eternal snows on the summits of extinct volcanoes. From Veracruz to Orizaba the grade of ascent is gradual, skirting the mountains and traversing valleys and canyons. At the latter point the tropical landscapes come to an end and are succeeded by those of the temperate zone, the altitude being 1,200 meters above sea level. The line continues its ascent, climbing the mountains over beds of volcanic formation at dizzy heights, through tunnels, etc., until the semicircular viaduct of "El Infiernillo" is reached, which is considered one of the boldest and most remarkable engineering feats of modern times. At this point the altitude reached is 2,450 meters above sea level, the line passing into the cold zone, and after a few hours' run the traveler enters the Central Plateau. The rapid descent of Maltrata, the grade being 4 per cent, necessitates the use of double locomotives of the Farlie system for the safety of the trains. From 1873 to December 31, 1897, the Mexican Railway carried 11,511,690 passengers and 8,295,734 tons of freight, yielding \$16,853,773 in fares, the total earnings of the line being \$88,772,354.96.¹

The Mexican Central Railway (*Ferrocarril Central Mexicano*) is the result of the amalgamation of different Government concessions, granted originally either to the company now in control of the line or to others. Work on the main line, from México to Paso del Norte, was commenced on May 25, 1880, and completed March 8, 1884, the total extent being 1,970 kilometers, which indicates a per diem labor rate of 1,500 meters. The expenses of construction are estimated at \$35,500,000, of which amount the Government contributed \$18,620,000. This is the longest and most important road in the Republic, having

¹The Mexican Railway connects in México City with the Mexican Central and Mexican National for northern and western points, and with the Interoceanic Railroad for Morales; in Puebla, with the Mexican Southern for Oaxaca, Puerto Angel, and Tehuantepec, and with the Interoceanic for Izucar de Matamoros; in San Marcos, with the Nautla Railroad for San Juan de los Llanos; in Esperanza, with the Tehuantepec Railroad; in Córdoba, with the Agrícola Railroad for Motzorongo and Tuxtepec; and in Veracruz, with the Alvarado Railroad for Tlacotalpam, San Andrés, Tuxtla, Cosamaloapan, and Playa Vicente, and with steamship lines for Mexican Gulf ports, namely, Progreso, Campeche, Carmen, Frontera, Coatzacoalcos, Tuxpám, and Tampico, and for Habana, and American, English, Spanish, French, and German ports.

connections with the United States and thereby facilitating trade, while at the same time it protects the States of Chihuahua and Sonora from the depredations of certain Indian tribes and assists in the development of the mineral wealth of the "Sierra." The total length in working condition was, on December 31, 1897, 3,153 kilometers 670 meters, as follows: México to Paso del Norte, 1,970 kilometers 300 meters; Silas to Guanajuato, 23 kilometers 370 meters; Tula to Pachuca, 70 kilometers; Irapuato to Ameca, 349; Chicalote to Tampico and La Barra, 687, and Lerdo to San Pedro, 63 kilometers.

The road was opened to regular passenger traffic on the 10th of April, 1884. The Guadalajara division was opened May 21, 1888, and the Tampico division was finished March 30, 1890, thereby bringing the line to the Gulf of México at Tampico. The railway is broad gauge, and traverses the Federal District, the States of México, Hidalgo, Querétaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Coahuila, Durango, and Chihuahua. It affords an outlet to the agricultural centers of San Juan del Rio, Penjamo, Silao, the extensive territory called El Bajío, and Lagos; to such manufacturing cities as Querétaro, Celaya, and Leon; to the rich mining districts of Pachuca, Zimapán, Guanajuato, Zacatecas, Sombrerete, Sierra Mojada, and Chihuahua; to the cotton country in the valleys of the rivers Nazas and Conchos; and to the commercial centers of México, Guadalajara, Aguascalientes, San Luis Potosí, and Tampico.¹

From 1881 to December, 1897, the Mexican Central carried 13,849,580 passengers, the receipts from this branch of the service being \$22,148,659.70; also 11,006,992 tons of freight, which produced \$83,389,899.68, or a total for the period under consideration of \$105,538,559.38.

¹The Mexican Central connects at El Paso with the Atchison, Topeka and Santa Fe; for all points northeast and west with the Texas and Pacific; with the Southern Pacific for points north and east; with Southern Pacific Company and the Atchison, Topeka and Santa Fe for points north and west in the United States; at Gallego, with stage for Ascencion, Casas Grandes, and Corralitos; at Chihuahua, with stage for Cusihuiriachic, Guerrero, and Rosario; at Jimenez, with stage for Allende and Parral; at Escalón, with Mexican Northern Railway for Sierra Mojada; at Torreon, with the Mexican International for Durango, Monterey, and Tampico, via the Mexican Gulf Railway; at Fresnillo, with stage for Sombrerete; at Zacatecas, with Sullivan Construction Railway for Ojo Caliente, with tramway for Guadalupe, and with stage for Jerez; at San Luis Potosí, with the Mexican National for Catorce Mines, Saltillo, Monterey, and San Miguel Allende; at Tampico, with steamers for Galveston, New Orleans, Mobile, New York, and European ports; at Celaya, with Mexican National for points north and south of that road; at Negrete, La Barca, and La Piedad, with stage for Zamora; at Guadalajara, with stage for Mazatlán, Tepic, and Zapotlán; at El Castillo, with tramway for the falls of Juanacatlán; at Atequiza, with stage for Lake Chapala; at the City of México, with the Mexican Railway and Interoceanic Railway for Puebla, Cholula, Orizaba, Veraacruz, Jalapa, Cuautla, Oaxaca via Mexican Southern; with the Hidalgo Railway for Tulancingo; at Huachinango, with the Mexican National for Toluca, Morelia, and Lake Patzcuaro, and with stage for Cuernavaca.

The Interoceanic Railway (*Ferrocarril Interoceánico*) is the result of a concession to build a road connecting Veracruz and Acapulco (hence its name Interoceanic), which was granted by the Mexican Government in April, 1878. The eastern section has been completed and the western portion as far as Tlalcualpican, while a branch line 200 kilometers long, from Los Reyes, near the City of México, to Amacuzac in the State of Morelos, is under construction. In 1897 the length of the line was 900 kilometers, the number in exploitation being 860, as follows: México to Jalapa and Veracruz, 547 kilometers; Reyes to Amacuzac, 197; Arcos to Tlalcualpican, 116 kilometers.

From 1880 to 1897 the earnings of the road were as follows: Passengers, numbering 12,028,286, product \$5,819,576.22, and freight, 4,419,437 tons, producing \$17,165,769.18. This line is in active competition with the Mexican Railway.¹

The Mexican National Railroad (*Ferrocarril Nacional Mexicano*) was inaugurated on November 1, 1888, but its construction had been under consideration since 1857. It is the shortest route between México and the United States, and, though a narrow-gauge line, is of no less importance than the Central. Its total length is 1,691 kilometers 150 meters, the distance from México to Laredo being 1,351 kilometers 50 meters; from Acambaro to Patzcuaro, 153 kilometers 400 meters; from Matamoros to San Miguel, 120 kilometers; from México to El Salto, 62 kilometers 700 meters, with an extension of 4 kilometers more at this point. This road traverses United States territory for a distance of 260 kilometers 700 meters, from Laredo (Texas) to Corpus Christi, the terminus of the line. From 1873 to 1897 the total earnings of the road were as follows: \$12,461,053.68 for passengers, and freight, \$37,185,525.63, a total of \$49,646,579.31; the number of passengers being 18,922,609 and the freight weighing 7,006,528 tons.²

¹This line connects at the City of México with Mexican Central and Mexican National railroads for points north and west; at Otumba, with Mexican Railway; at Irolo, with Hidalgo Railway for Pachuea; at Puebla, with Mexican Southern for Oaxaca, with Mexican Railway for Tlaxcala, and with Industrial Road (animal traction); for Cholula and San Marcos, with the Nautla Railroad and Mexican Railway; at Jalapa, with tramway for Coatepec; at Veracruz, with Mexican Railway for Alvarado, and with steamers for Gulf ports, Habana, United States, and Europe; at Compañía, with tramway for Chalco; at Yantepec, with private conveyance for Cuernavaca; at Jojutla, with stage for principal towns in the State of Guerrero.

²The connections of the Mexican National are at Laredo, for points north and east in the United States; at Matamoros, with the Mexican Gulf Railway for Venadito, Montemorelos, and Tampico; at Vanegas, with Vanegas, Cedral and Rio Verde Railroad for Cedral and Matehuala; at San Luis Potosí, with Mexican Central for Aguascalientes and Tampico; at Celaya, with same road for Guanajuato and Guadalajara; at Maravatio, with Michoacán and Pacific Railroad for Angangué; at Toluca, with San Juan Railroad for Valle; at México City, with the Hidalgo, the Interoceanic, and the Mexican for Pachuea, Puebla, Veracruz, Jalapa, Orizaba, and Cuautla Morelos.

The Mexican International Railway (*Ferrocarril Internacional Mexicano*).—This standard-gauge railway is an extension of the Southern Pacific. It is the only trunk line built in México with United States capital without a subsidy. Believing that a road from the Rio Grande toward the Pacific Ocean would cross a section of the Republic of México susceptible of great development, this company obtained certain concessions in 1881, modified in 1882 and 1883, and work was immediately commenced at Ciudad Porfirio Díaz and the Lampazos branch, thereby reaching the coal fields of San Felipe. The track of the main line to Torreón was completed January 12, 1888, and the operation of the road was commenced two months later. The San Pedro branch was built in 1890, and the main line was completed October 1, 1892, to Durango, the capital of the State of Durango. This road traverses the States of Coahuila and Durango, and will extend through Sinaloa to reach Mazatlán, on the Pacific coast. It touches Eagle Pass, Allende, Sabinas, Monclova, Treviño, Jaral, Paila, Torreón, and Durango. The length of the main line, Ciudad Porfirio Díaz to Durango, is 869,510 meters; of the branches, Sabinas to Hondo, 19,810 meters; Hornos to San Pedro, 23,400 meters; and Pedriceña to Velardeña, 9,370 meters.

From 1884 to 1897 the total earnings of this road amounted to \$18,282,639.79, divided as follows: Passengers (820,779), \$2,266,578.09, and freight (3,605,189 tons), \$16,016,058.70. The total length in operation in 1897 was 1,061 kilometers 510 meters.¹

The Monterey and Mexican Gulf Railway (*Ferrocarril de Monterrey al Golfo Mexicano*) is now the property of a powerful Belgian company, but the original grant of November 10, 1887, was made to an American company, which built the line, afterwards transferring it to the present owners. It extends from Treviño (formerly Venadito), in the State of Coahuila, on the International line, as far as Tampico, on the Gulf of México, a distance of 624 kilometers 640 meters, passing through Monterey, the capital of Nuevo Leon, and Ciudad Victoria, in Tamaulipas. This road connects at Treviño with the International for Torreón, Durango, and points north; at Monterey with the Mexican National for points north and south on that line; at Tampico with the Mexican Central for San Luis Potosí and Aguascalientes, and with steamers for Gulf ports, the United States, Cuba, and Europe.

¹Connections: At Eagle Pass, with the Southern Pacific Company for all points in the United States; at Allende, with stage for Zaragoza; at Sabinas, with stage for San Juan de Sabinas; at Felipe, with stage for Juarez and Progreso; at Berroterán, with stage for Villa de Musquíz (Santa Rosa); at Monclova, with stage for Cuatro Ciénegas and Sierra Mojada; at Treviño, with the Mexican Gulf Railway for Monterey, Tampico, and points on the National; at Jaral, with stage for Saltillo, the capital of the State of Coahuila; at Paila, with stage for Parras; at Hornos, with stage for Viesca; at Torreón, with the Mexican Central Railway for all points on that line and its connections.

The earnings of the road since 1889, the date of its inauguration, up to December 31, 1897, were \$5,321,018.34, divided as follows: Passengers (627,836), \$770,377.43, and freight (1,443,440 tons), \$6,091,395.77.

The México, Cuernavaca and Pacific Railway (*Ferrocarril de México á Cuernavaca y el Pacífico*) has a total operating length of 159 kilometers, the concession for its construction dating May 30, 1890. The first division, from the capital to Cuernavaca, a distance of 119 kilometers, was opened to traffic on December 12, 1897. Beyond Cuernavaca there is a branch line, 40 kilometers long, connecting Puente de Ixtala and Iguala, which is also open to traffic, and the entire road will soon be completed. From 1895 to 1897, the movement of the line is represented by 59,146 passengers and 180,016 tons of freight, the total earnings being estimated at \$464,488.49, of which \$63,167.45 is for passengers and \$401,321.04 for freight.

The concession to the México, Cuernavaca and Pacific Railway, modified on March 18, 1897, has been recently again modified in two or three of its articles. According to the first article of the original concession, the principal route was to run from the City of México to Cuernavaca, and then, following the Las Balsas River, to touch at Organal, or some other convenient point, to meet the line of the Inguarán Railway Company, and follow this line to the port of Zihuantanejo, and thence, should it suit the company, to reach Acapulco, with the further obligation to construct a branch line from the most convenient point on the main artery to Chilpancingo. The modification which has been made is to the effect that if within the term of five years the railroad from Organal to Zihuantanejo, to which the concession granted the Inguarán Railroad of September 14, 1898, refers, should not be constructed, the México, Cuernavaca and Pacific Railway is bound to construct the said line. In case the former company should build the railroad mentioned, the latter company shall have the right to construct a line between the points mentioned should it suit their interests. In view of the greater length that the new line will have along the Balsas River to Organal, with the branch to Chilpancingo, the México, Cuernavaca and Pacific Railway, instead of 60 kilometers, will have to deliver to the Government 100 kilometers every two years. The construction of the Chilpancingo branch is to commence six months after the initiation of the work on the main line, the company being bound to construct 1 kilometer on the branch for every section of 4 kilometers in length built on the line from the Balsas River to Organal, in the understanding that by June 30, 1906, the main and branch lines shall be completed.

The National Interoceanic Tehuantepec Railroad (*Ferrocarril Nacional Interoceánico de Tehuantepec*) is destined to be one of the most important in the Republic. The project was to build across the Isthmus of Tehuantepec and connect the Atlantic and Pacific oceans.

The idea of a highway for this purpose is very old, dating from the time of Cortés. Surveys and plans have been made from time to time, but those of Captain Eads take the first place. The first serious efforts to realize this great work began in 1879, when an American company obtained a concession; but, unfortunately, the company was declared bankrupt in 1882. In 1883 the Mexican Government undertook to build the road and laid rails for a distance of some 40 kilometers. In 1889 and 1890 about 100 more kilometers of rails were laid under the McMurdo contract, and it was supposed that there remained only 100 kilometers more to build. In 1891 the McMurdo concession was rescinded and a new contract was made with Stanhope, Corthell & Hampson. By virtue of the authorization which Congress gave the Executive in the year 1895, a contract was entered into with Stanhope & Corthell for the completion of the road.

The total length of the line from Coatzacoalcos on the Gulf to Salina Cruz on the Pacific measures 309 kilometers 617 meters. The Government, pursuant to the authority of Congress, has recently leased the road to S. Pearson & Son, of London, for fifty years. The firm contracts to build two harbors, one at Coatzacoalcos and the other at Salina Cruz and to rebuild and repair the railroad. The Government guarantees 6 per cent on whatever investment is made in the work, the excess over this percentage reverting to the Government. The firm is to exploit the harbors for its own benefit. The estimated cost of the work at Coatzacoalcos is between \$1,500,000 and \$2,000,000 gold and at Salina Cruz between \$8,000,000 and \$10,000,000 gold. At the expiration of the fifty years the line, together with the harbors, will again become the property of the Government.¹

The Rio Grande, Sierra Madre and Pacific Railroad (*Ferrocarril del Rio Grande, Sierra Madre y el Pacifico*) is a new road built entirely by New York capital, under a grant bearing date of March 24, 1896. It runs from Ciudad Juarez (Chihuahua) to the southeast part of the Republic. Ground was broken for the inception of the line on August 15, 1896, and the first passenger train ran over the completed line to Casas Grandes, a distance of 250 kilometers, on June 27, 1897. The cost of construction was \$8,400 per English mile, and other expenses, such as right of way, equipment, telegraph lines, etc., amounted to about \$2,475 more. The company claims that when the road was completed it was fully paid for, represented cash expended, and that no bonds have been issued or loans placed, nor is there one

¹The road traverses the States of Veracruz and Oaxaca, touching Coatzacoalcos, Minatitlán, Suchil, Tehuantepec, and Salina Cruz. At Coatzacoalcos it connects with steamers for Gulf ports, Havana, United States, and Europe; at Tehuantepec with private conveyance for Oaxaca, Miahtlán, and Pachutla, and at Salina Cruz with steamers for Tonakí, San Benito, and other Pacific Coast ports.

cent of outstanding indebtedness. It is proposed to extend the road to the Pacific Ocean.

The following table shows the earnings of the other railways in México from the date of inauguration to December 31, 1897, the figures being obtained from official data:

Name of line.	Period of operation.	Passengers.	Earnings.	Freight.	Earnings.	Total.
Vera Cruz and Alvarado Railway	1885-97	864, 124	\$536, 500	<i>Metric tons.</i> 182, 140	\$565, 736	\$1, 102, 236
Sonora Railway	1881-97	723, 529	1, 745, 986	687, 807	4, 420, 240	6, 166, 226
Hidalgo and Northwestern	1881-97	1, 772, 683	1, 524, 104	1, 783, 880	4, 646, 863	6, 170, 968
Merida and Progreso	1881-97	1, 450, 428	640, 846	681, 488	1, 494, 656	2, 135, 502
Tehuacán and Esperanza	1881-97	443, 749	160, 014	140, 615	560, 520	720, 534
Merida and Peto	1881-97	1, 845, 467	658, 365	402, 380	1, 146, 331	1, 804, 695
Sinaloa and Durango	1882-97	506, 161	200, 885	124, 221	422, 050	622, 935
Merida and Campeche	1883-97	1, 158, 629	385, 583	162, 355	377, 016	762, 599
Merida and Valladolid	1883-97	2, 612, 700	672, 732	549, 562	1, 251, 891	1, 924, 623
Tlalmanaco	1883-97	618, 665	68, 025	152, 439	115, 825	183, 850
San Marcos and Nautla	1891-97	95, 768	57, 347	118, 495	166, 071	223, 418
San Juan Bautista to Paso del Carrizal	1888-97	1, 173, 248	79, 464	14, 354	13, 094	92, 558
San Andrés to Chalchicomula	1882-97	178, 700	48, 352	83, 066	120, 817	169, 168
Orizaba to El Ingenio	1882-97	1, 693, 952	210, 475	8, 288	7, 062	217, 537
Santa Ana to Tlaxcala	1883-97	1, 374, 271	114, 595	11, 228	23, 148	137, 743
Toluca and San Juan de las Huercas	1885-97	1, 871, 754	179, 477	156, 863	116, 128	295, 605
Vanegas and Río Verde	1889-97	228, 998	89, 961	530, 507	806, 035 ^a	895, 996
Merida and Izamal	1887-97	690, 001	451, 360	107, 937	528, 926	980, 286
Southern Mexican	1890-97	1, 231, 450	1, 120, 052	254, 388	1, 823, 547	2, 943, 599
Salamanca to Valle de Santiago	1889-97	205, 517	68, 739	32, 416	69, 964	138, 703
Montealto	1892-97	208, 841	21, 321	29, 183	9, 862	31, 183
Industrial Railway of Puebla	1891-97	1, 362, 857	215, 968	54, 478	46, 988	262, 956
Northern Mexican (mining) Road	1891-97	26, 896	81, 848	928, 038	6, 966, 211	7, 048, 060

In 1898 the earnings of the Mexican railways amounted to \$30,930,333, while in 1899 they rose to \$35,791,493.

The railways in the Federal District show earnings to the amount of \$21,458,701 for the period between 1873 and 1897, the number of passengers carried being 264,336,645, which produced for the line \$18,362,670.

In addition to those mentioned there are several minor roads in operation, besides others under construction or projected, among which may be mentioned the following: A line from Bahía de la Asunción, inland, touching at San Antonio Muxil and other towns and connecting with the Mérida and Peto line; from Campeche to the Isthmus of Tehuantepec, to connect at "El Juile" with the Interoceanic, with a branch to the Guatemalan frontier; from Córdova to Tehuantepec; from Saltillo to Paredón Treviño or any other point on the Monterey line; from Mazatlán to Rosario and extending to Villa Unión (Sinaloa); from San Marcos to Tecolutla, to be built entirely by Mexican capital and to connect the Mexican and the Interoceanic at San Marcos, thus communicating with the City of México and Vera Cruz; from Chihuahua to the Pacific, extending from the former city to San Andrés and thence to Ciudad Guerrero, and one to connect Matanzas with Monterey and Laredo. Other prospective lines have been treated of in the publications of the Bureau of the American Republics.

The new railroad law of the Republic,¹ whereby those of December 25, 1877, and December 16, 1881—with the exception of those clauses relating to the acquirement of telegraph and telephone lines by the Government—are repealed, was promulgated April 29, 1899. The law, which is one of considerable length and containing 16 chapters and 187 articles, is intended to cover everything connected with the granting of concessions, each concession having formerly been the occasion of a special law. This general law will hereafter apply both to new concessions and to those previously granted the terms of which shall not conflict with the law. It also increases the difficulties of obtaining subsidized concessions and emphasizes the control exercised by the Government over companies.

Chapter I of the new law is devoted to the classification of railroads subject to the Federation, which are divided into two classes, viz:

I. General routes of communication.

II. Routes of local interest in the Federal District and in the territories.

III. Routes of local interest in the State.

To the first class belong those connecting two or more States or connecting the Federal District or a territory with one or more States; those touching at a port or at some point on the coast of the Republic or at some point on the border line with a foreign State, and those running wholly or in part within a zone of 100 kilometers from the dividing line with a foreign State.

To the second class belong the railroad lines connecting two or more towns of the Federal District or of a territory with one another, and those which, while not connecting two or more towns by entering to their center, have one of their terminals on the outskirts of a town.

Railroads built or projected within the territory of a State, whether under a State concession or not, shall be classed as routes of local interest subject to the Federation, providing that the concession has been granted by the Federation, or that a subsidy, exemption from duties, release from taxation, or any other aid has been granted by the Federation.

General routes of communication are subdivided into lines of prime and secondary importance, the lines of prime importance being:

I. A line connecting the city of Chihuahua with a port on the coast of Sonora or the north of Sinaloa.

II. A line connecting the City of México with a port in the State of Guerrero.

III. A line connecting the Mexican Railway between Orizaba and Veracruz with the Tehuantepec Railroad.

IV. A line from Guadalajara to Tepic and Mazatlán.

¹ For the convenience of persons wishing to familiarize themselves with the full text of the law, it is kept on file, both in Spanish and English, at the library of the Bureau of the American Republics.

V. A line from Guadalajara or some other point and the Mexican Central to Colima and Manzanillo.

VI. A line connecting the Tehuantepec National Railroad with the frontier of Guatemala.

VII. A line connecting the Tehuantepec Railroad with the States of Tabasco and Campeche.

VIII. Any other line which, in the opinion of the Department of Communications and Public Works, is of general interest and its construction an urgent necessity, provided the requirements of the law are complied with.

The construction of railroads subject to the Federation shall be carried out by corporations or private individuals under concessions to be granted by the Executive of the Union, subject to the provisions of the law. Private persons to whom concessions are granted are empowered to form companies, the same rule being applicable to corporations.

In order to obtain a concession for the construction of a railroad the petition must be made to the Department of Communications and Public Works, setting forth the following points:

I. The terminals of the road and the intermediate points at which it touches either directly or by means of branches.

II. The period within which the survey of the road is to begin.

III. The minimum number of kilometers to be built annually.

IV. The period within which the road is to be completed.

V. The schedule of maximum rates to be charged for the transportation of passengers and merchandise, for express and baggage, for telegraph service, and for the use of the track by other lines.

VI. Any other facts that may be deemed expedient.

After the proposition has been accepted, with the modifications deemed proper by the Department and the terms of the contract have been agreed upon, the applicant shall make a deposit in the general Treasury of the Federation at the rate of \$150 per kilometer in securities of the consolidated public debt. If this provision is not complied with, the application shall be regarded as having been withdrawn and a declaration to that effect shall be made by the Department of Communications and Public Works, without subsequent appeal.

After the deposit has been made the contract will be signed and made public in the "Diario Oficial," the date of publication being the point of reckoning for all periods named in the document, unless otherwise specified.

Concessions for the lines of prime importance which have not been granted, or which having been granted shall lapse in the future, can only be granted to the companies which, besides the requirements already expressed, shall present proof covering the following points:

I. The existence of the company and its organization in conformity with the laws of the country whence the document in regard to its

organization proceeds. This proof, if the company has been organized in the Republic, shall be furnished by means of a certified copy of the draft (*minuta*) of the articles of association, which shall be raised to the rank of a public instrument in case the concession is granted; and if the company has been organized abroad, by the presentation of the documents required by article 24 of the Code of Commerce,¹ and in case the concession is granted such documents need only to be protocolized, registered, and stamped.

II. That the company has, either on hand or assured, the subscription and payment of the capital necessary for the survey of the land, the preparation of plans, and the fulfillment of the obligations set forth in the law.

If the proposition is accepted, the procedure shall be as stated above, but the deposits shall be at the rate of \$200 per kilometer in securities of the consolidated public debt.

The construction of other lines shall be subject to bids, as provided by law.

Railroad concessions carry with them the following rights:

I. The right to construct the railroad.

II. The right to build a telegraph and telephone line.

III. The right to exploit the railroad and the telegraph or telephone line for the entire period of the concession.

The telegraph or telephone line built under the concession can only be exploited for the service of the road, of passengers traveling thereon, and of shippers or consignees of freight on matters connected with their business with the road. The telegraph line can not be operated in any other manner nor on other service, except with the authorization of the Department of Communications and Public Works, which at all times shall have the right to revoke the authorization granted.

The system of traction to be used shall be set forth in the concession.

Railroads constructed within the territory of a State and not coming under either of the classes mentioned shall, from the moment they join or connect with a road under the Federation, become subject to all Federal laws and regulations, as provided by law.

The deposit that is made guarantees the performance of the obligations contracted by the concessionaire, and shall be returned to him when all the works covered by the concession have been completed.

¹Article 24 of the Code of Commerce provides that "foreign companies desirous of establishing themselves or their branch offices in the Republic shall present and file in the register's office, besides the proofs of the protocolization of their statutes, contracts, and other documents referring to their organization, their inventory or last balance sheets, if they have any, and a certificate showing that such companies have been duly organized and authorized in accordance with the laws of their respective countries. This certificate must be given by the Mexican minister residing at the respective places, and in his absence, by the Mexican consul.

Until such time as the deposit is returned, and unless it has been forfeited, the interest coupons shall belong and shall be delivered to the concessionaire.

Concessions may be transferred wholly or in part to other companies or individuals, with the consent of the Department of Communications and Public Works, according to the provisions of the law.

Under no circumstances can the company transfer, mortgage, or in any other manner dispose of a concession or any of the rights which it carries, or of any of the property or belongings connected with said line, to a foreign Government or State, and any sale, assignment, transfer, or mortgage infringing this rule shall be null and void. A company may not allow a foreign Government or State to become a partner, and any agreement infringing this rule shall likewise be null and void. All shares, securities, or bonds issued by the company and acquired by a foreign Government or State shall, from the moment of such acquisition, be deprived of all force and value for their holder, who shall forfeit to the nation all the rights attached to such shares, securities, or bonds.

Concessions for railroad lines shall not be granted for a term exceeding ninety-nine years. At the close of this period the railroad, with all its appurtenances, shall pass, in good condition and free from all incumbrance, into the control of the nation; but the Government must purchase the rolling stock, appliances, chattels, and equipment that may be necessary to continue the operation of the road, paying in cash the price of valuation by appraisers appointed as provided by the law. The Government shall be entitled to the earnings of the railroad during the five years preceding the date of the reversion, to be employed for the benefit of the road in case the company fails to comply with the provisions regarding its transfer in good condition.

No railroad concession implies a monopoly for the benefit of the concessionaire, but a stipulation may be introduced into concessions to the effect that within ten years no other concession shall be granted for a line parallel to the former, wholly or in part within a territory of a width to be determined on both sides of the road, or that no subsidy, exemption from taxes, or other franchises shall be allowed to lines for the construction of which within said territory a concession may be granted.

The Executive of the Union, in compliance with this law, may at all times and in concert or under an agreement with the companies, add to, modify, or rescind existing railroad concessions.

A concession shall lapse for any of the following reasons:

I. Failure to commence the surveys within the time specified.

II. Failure to construct, in a year, the number of kilometers required by the concession, or to complete the line within the period allowed by said concession.

III. The total or partial interruption of the public service of the road, save in the case of fortuitous or unforeseen circumstances, as defined by law.

IV. The sale of the concession or of any of the rights granted by it to a company or individual, without the previous consent of the Department of Communications and Public Works.

V. The transfer, sale, or mortgage of the concession, or of any of the rights conveyed, or any of the properties attached thereto, to a foreign Government or State, or the admission of such a partner in the enterprise.

In order that the circumstance may be declared to be fortuitous, the company must present to the Department of Communications and Public Works, within three months from the occurrence, a written statement, detailing the event and showing proof thereof, as provided by the law. The Department of Communications and Public Works, in view of the company's statement, shall decide whether or not the concession is thereby forfeited. If the decision rendered is in favor of the company, an extension of time, at the discretion of the Government, shall be allowed in which the company may fulfill the obligations entailed by the concession.

The concessionaires are entitled to enter into contracts with other individuals or companies for the construction of the road, but these contracts shall have no recognition from the nation until they are submitted to the examination and approval of the Department of Communications and Public Works. Failure to comply with this does not entail a forfeiture of the concession, but the constructing company and the concessionaire shall be considered as one and the same for all legal purposes connected with the nation; and for all such purposes, as well as for all business appertaining to the construction of the road and the concession in which the nation has an interest, only the original concessionaire shall be recognized.

Whenever a concession is forfeited, the concessionaire shall lose his deposit, which reverts to the nation. When the concession is forfeited for any of the causes mentioned in Paragraphs I and II, above, the company shall preserve the right of ownership of the buildings it may have erected, the portion of the railroad and telegraph line it may have built, and to the materials, machinery, and utensils employed in the operation of the road, according to the law.

In the event of the public service of a railroad being interrupted, wholly or partially, the Department of Communications and Public Works shall, at once and at the expense of the company, take steps to assure its continuance provisionally, as provided by this law. In the event of forfeiture for the cause mentioned in Paragraph IV, the company shall lose the right to operate the railroad, telegraph, and telephone line, the Government succeeding to that right and entering

into possession of the line and its appurtenances, a receiver being appointed, as provided by the Code of Commerce, and the operation of the line continued under Government auspices. The next step will be the judicial sale, at public auction, of the property mentioned, and the Executive shall determine the conditions under which the sale is to take place.

In the case of forfeiture for the cause mentioned in Paragraph V, the company shall forfeit to the nation the portion of the road already constructed, but the nation will be liable for the mortgage and other debts contracted prior to the declaration of forfeiture, to an extent proportionate to the value of the property. Within six months from the time that the Executive takes possession of the property, it shall decide whether the nation shall assume the responsibility mentioned and undertake the administration of the road.

The declaration of forfeiture shall be made through the administrative channel by the Executive, after the company has been heard, for which purpose it shall be allowed a specific period to give such explanation as may be deemed pertinent. At the expiration of this period, the Executive shall, if deemed necessary, make further inquiries and announce its decision. As soon as the concession of a railroad is declared to have been forfeited, all the privileges and exemptions granted by the concessions shall cease.

A declaration of forfeiture can only be contested before the courts for one of the following reasons:

I. That the reason adduced does not constitute a legal ground for a declaration of forfeiture.

II. That the fact or omission adduced as a reason for forfeiture is not as stated.

If the declaration of forfeiture is not contested before a competent court within the period of one month from its communication to the company, it will be assumed that the company acquiesces in the decision of forfeiture, and no further action will be taken.

Railroads may, in the concessions, be divided into several sections, so that the forfeiture of some will not affect the continuance of others, and each section between its terminal points must be considered as a separate line to be operated independently.

In cases where there is no ground for a declaration of forfeiture, but where there is sufficient ground for annulment of the concession, the deposit above mentioned shall be forfeited, but during the suit, and until the final sentence of annulment is rendered, the company shall continue to enjoy all the rights appertaining to it under the concession, without detriment to provisional and precautionary measures, when, according to law, there is occasion for them.

As regards the nationality and legal status of companies, those whose

object is to construct or to operate, or to construct and operate a railroad, may be organized in the Mexican Republic or abroad; but under all circumstances such companies shall be regarded as Mexican, even though the entire organization is foreign. Said companies shall be subject to the courts of the Republic, whether Federal or local, in all matters coming under the jurisdiction of the courts, and foreigners and their successors who shall be interested either as shareholders, employees, or in any other capacity, shall in all cases be regarded as Mexicans in so far as the companies' affairs are concerned. On no pretext whatever may rights as foreigners be urged with respect to titles (*títulos*) and affairs connected with the companies, and only such rights and the means of enforcing them shall be enjoyed as are granted by the Mexican law to citizens of the Republic; consequently foreign diplomatic agents may not interfere in any way.

Companies shall have one or more attorneys in the capital of the Republic, who shall be empowered to deal with the Federal authorities and other public officers in all matters relating to the concessions, but the headquarters of all companies shall be at the town named in the concessions, this, however, not preventing the establishment of agencies in different parts of the country or abroad.

In cases when the board of directors of railroad companies reside abroad, a local board, resident at the headquarters of the company within the Republic, or at such place as shall be designated in the concession, shall be appointed, which board shall be regarded as part of the board of directors.

For the issuance of shares and bonds, the following rules shall be observed:

I. After the plans and profiles have been drawn up, an estimate shall be made on the cost of the entire work.

II. On the basis of that estimate and of the rights of the concessionaire, the capital in shares and bonds shall be determined with the approval of the Government.

III. The provisions of the foregoing paragraph do not prevent, pending the preparation of the estimates, the issuance of shares and bonds or the acquisition of funds by any other means for the construction of the road.

IV. The amount of the capital in shares and bonds may be increased, even after the preparation of the estimate and after the capital has been fixed, provided that the necessities of construction or operation require it.

V. The right to issue shares and bonds does not imply that by these means alone the company may obtain funds, as to that end all legal methods may be employed.

VI. The company is obliged to inform the Department of Communi-

cations and Public Works of all the steps taken and all the contracts entered into pursuant to the rights conferred on it by this article.

All contracts entered into abroad are subject to the laws of the Republic, as provided by this law. Contracts for the acquisition of material for the equipment of the railroad and rolling stock are subject to special regulations.

Railroads, being works of public utility, are in consequence entitled to condemn (expropriate) land and construction material belonging to private individuals which may be necessary for the establishment and repair of the road and its appurtenances, stations, and other annexes. This, however, does not include the right of condemnation of water rights, without special authorization in each case by the Executive. The process of condemnation is subject to certain regulations, as prescribed by the law.

In the matter of franchises and exemptions granted to concessionaires, the law provides that foreign capital employed in the construction and operation of railways, and the loans contracted for that purpose, be placed under the guardianship of the nation and are exempt from reprisal, confiscations, and attachments in case of war. The capital and property of a railroad company shall be exempt from all Federal and local taxation save the stamp tax, provided they are applied directly to the purposes set forth in the concession. The stamp tax applies only to the documents, acts, contracts, and transactions to which the company is a party. The general routes of communication, their appurtenances, the capital, shares, bonds, etc., employed, shall at no time be taxable by the States of the Federation.

A company may import, free of all import and custom dues, all fixed material for the line, rolling stock, telegraphic materials, cars, etc., necessary in the construction and operation of the line, also for maintenance and repairs of the railroad and telegraph line, for a period not exceeding five years, said articles also being exempt from all taxes, whether Federal or local, for a like period. If any of these materials shall be sold or applied to other uses, the Department of Finance shall exact the payment of the duties, subject to the provisions of the law.

The lines of prime importance may be subsidized; and in certain cases, as provided by law, other lines also. Subsidies shall be subject to the following rules:

I. No subsidies for the construction of railroads shall be granted when the payment of said subsidies can not be covered by the budget appropriations available for that purpose, except in the cases provided by law.

II. The subsidy shall be paid with respect to sections of at least 100 kilometers, constructed and accepted by the Department of Communications and Public Works, in the amount and according to the

conditions to be determined in each particular case, except that if when the line is completed its last section measures less than 100 kilometers, the amount appertaining to that section shall be paid upon its completion.

III. The subsidy shall be paid in bonds of the public debt, the Executive reserving the right of deciding in each case in which of the two following forms payment is to be effected:

(a) In 5 per cent bonds of the redeemable debt.

(b) In bonds of other descriptions, according to the conditions and terms to be determined.

Land belonging to the nation, and needed by the company, shall, with the approval of the Executive, be made over to the company without any payment whatever. The company shall also be entitled, under the same conditions, to take from lands belonging to the nation, and from its rivers, all materials that may be necessary for the construction, operation, and repair of the road and its appurtenances, but, in taking out such material, the company is subject to the laws and regulations bearing upon the case.

If the road terminal be at a seaport the company shall be entitled to build one or more wharves, subject to the rules and conditions determined in the concession. Deposits and other mineral substances which, according to the mining law, do not belong to the owner of the soil, and which may be found during the construction of a railroad, shall be the property of the company, provided it is denounced within three months from the date of discovery.

Officials and employees of railroad lines are exempt from military service, except in case of foreign war.

Railroads shall be constructed in accordance with the provisions of the railway ordinances now in force or to be issued in the future.

The policy of a road, as expressed in its laws and regulations, shall provide suitable measures for its maintenance and safety, but no railroad can be put into operation without having been previously inspected as provided by the ordinances, and accepted by the Department of Communications and Public Works.

The tariffs of railroad transportation shall include the rates for which transportation shall be effected, and the conditions according to which companies bind themselves to perform this service according to the provisions of the law. General regulations governing the transport of passengers and freight, and the liability of railroad companies for possible damages sustained thereby, are fully covered by Chapter VII of the law. In return for the concession to construct railroads the nation reserves certain privileges or rights, touching reduced tariff rates for the transportation of colonists and immigrants, employees, agents, and officials travelling on public business; for the transporta-

tion of troops, ammunition, etc.; the transmission of telegraph messages; the free transport of mail and mail officials; the use of special trains at any time, and certain other privileges, as set forth in the law.

On all railroads the Executive possesses the right of inspection, exercised either directly by means of the Department of Communications and Public Works or by means of special agents.

Any infringement of this law is punishable by a fine of from \$20 to \$2,000 and imprisonment, according to the circumstances of the case.

The law also defines what is considered a crime or a fraud against property and prescribes the consequent penalties.

The railroads dependent on the Federation are subject exclusively to the Federal powers, the legislative, executive, and judicial branches having each their respective jurisdictions. Questions which may arise concerning the interpretation or fulfilment of concessions or of any of the stipulations contained therein, shall be decided by competent tribunals of the Republic and by the civil code of the Federal District.

The great difference in the relative cost of construction of telegraph and railway lines may undoubtedly be considered as the reason of the more extended development of the former means of communication. In 1877, Federal telegraph lines measured 7,927 kilometers; in 1892, 35,500 kilometers had been built, while in 1896, a network of lines 45,000 kilometers in length traversed the Republic under Government control. At the present time there is not a State capital nor any fairly important town which does not enjoy the benefit of telegraphic communication with the outside world.

In México, this branch of public service is divided into four classes: Federal telegraph lines, railroad telegraphs, lines belonging to private parties, and those which are State property. On June 1, 1891, the Federal service was organized into 20 districts (*zonas*), each under the immediate supervision of an inspector, the total number of offices being 280 and the extent of lines 29,305 kilometers. About the same time the Government purchased the Jalisco line, 2,514 kilometers in extent, making a total of 31,819 kilometers. On December 31, 1897, according to the latest available official data, México contained 19 Federal telegraphic *zonas*, with 327 offices and a total length of line measuring 45,435 kilometers, 968 meters, the entire telegraph system at that time being as follows:

	Kilometers.
Federal lines.....	45,435.968
State lines	8,321.683
Private lines	4,730.980
Railroad lines.....	9,761.611
Total	68,250.242

The State telegraph lines were distributed as follows:

State.	Number of offices.	Total length.
		<i>Kilometers.</i>
Chiapas	2	30,000
Chihuahua		225,000
Durango	3	210,700
Guanajuato	4	108,000
Hidalgo	33	923,755
Jalisco	29	1,006,000
México	8	257,117
Michoacán	21	1,036,277
Morelos	9	195,845
Oaxaca	8	310,400
San Luis Potosí	14	473,220
Sinaloa	5	269,080
Sonora	1	50,000
Tamaulipas	4	260,000
Yucatán	19	1,580,750
Zacatecas	29	1,385,539

The private telegraph lines amounted to 10 in number, with 44 offices, measuring 1,805.248 kilometers, while the cable lines comprised 2,925.732 kilometers, as follows:

Submarine cable:

	<i>Kilometers.</i>
Tampico to Galveston	791,783
Tampico to Veracruz	395,891
Veracruz to Coatzacoalcas	207,601
Salina Cruz to La Libertad	698,442

Land line:

México to Veracruz	429,687
Coatzacoalcas to Salina Cruz	402,328

The railroad telegraph lines were divided thus:

	<i>Kilometers.</i>
Ferrocarril Mexicano de Veracruz	1,080,710
Ferrocarril Nacional Mexicano	1,699,790
Ferrocarril Central Mexicano	2,932,450
Ferrocarril Internacional Mexicano	989,440
Ferrocarril Mexicano del Sur	367,000
Ferrocarril Interoceánico	783,607
Ferrocarril México, Cuernavaca y Pacífico	74,385
Ferrocarril Mexicano del Norte	130,260
Ferrocarril Nacional de Tehuantepec	309,617
Ferrocarril de Veracruz á Alvarado	70,410
Ferrocarril de Monterey al Golfo	624,640
Ferrocarril de Sonora	422,302
Ferrocarril de Tula	70,000
Ferrocarril de la Compañía Constructora Nacional Mexicana	142,000
Ferrocarril de Vanegas, Cedral, Matehuala y Río Verde	65,000
Total	9,761,611

Of late years the Federal Government has leased certain lines of its telegraph system to 20 different States, thereby saving the operating expenses of the lines without detriment to the public service.

The Republic is connected by telegraph with both Guatemala and

the United States, and in December, 1897, the President of México approved and proclaimed a contract between his Government and the Western Union Telegraph Company and the Mexican Telegraph (cable) Company, both of which are American corporations, whereby communication by wire between México and foreign countries is to be carried on solely by means of the Federal telegraph system, in connection with those of the companies named. By the terms of the contract the Mexican Telegraph Company binds itself to pay to the Mexican Government 15 per cent of its annual profits, derived both from land and cable lines, it being further guaranteed by the company that said 15 per cent shall not amount to less than \$20,000, gold, per annum during the term of the contract.

The number of telegraphic messages sent annually has steadily increased from 1,101,916 in 1891-92, to 1,865,303 in 1897.

Telephone service throughout the country is excellent and daily improving. On December 31, 1897, the total extent of the telephonic system in the Republic was as follows:

	Kilometers.
State city lines.....	1, 107. 158
State suburban lines.....	6, 454. 992
Private city lines.....	1, 953. 675
Private suburban lines.....	5, 335. 584
Mexican Telephone Company.....	3, 260. 454
Railroad telephones.....	1, 604. 079
Private individuals' suburban lines.....	5, 780. 222
Total.....	25, 496. 164

The number of State city offices was 1,237, the number of offices credited to State suburban lines being 551 and to the Mexican Telephone Company 2,031.

The combined length of telephone and telegraph lines throughout the Republic on the date named was 93,746.486 kilometers.

Prior to 1877 México may be said to have been isolated so far as activity in maritime commerce or communication was concerned, but since that time the Mexican Government has given great impetus to sea transportation by granting subsidies and special concessions to companies and individuals.

Up to 1896, 21 steamship lines had contracts with the Government for carrying the mails, of which 10 were Mexican, 4 American, 4 English, 1 Spanish, 1 French, and 1 German. Eight of these lines enjoy subsidies ranging from \$75 to \$2,000 for the round trip, or from \$6,600 to \$15,000 per annum. The other lines enjoy certain privileges and exemptions.

Latest official statistics (1897) report the following steamship lines as under contract with the Government to perform postal service:

The New York and Cuba Steamship Company (American).—This

company has no subvention, but enjoys special exemptions. The steamers are required, under the terms of the contract, to make 52 regular trips to and from Progreso, New York, Habana, Veracruz, Tuxpam, and Tampico, and Frontera, or Frontera and Campeche alternately.

The German Imperial Mail (German).—This line enjoys special exemptions, and is required to make at least 1 monthly trip to and from Hamburg, Havre, Veracruz, Tampico, and Progreso.

Harrison Line (English).—This line enjoys special exemptions, and is required to make at least 1 trip per month to and from Liverpool and Veracruz, with the privilege of stopping, on either trip, at Tampico, Tuxpam, Frontera, Campeche, and Progreso; also, at Barbados, St. Thomas, Trinidad, La Guaira, Puerto Cabello, Curaçao, Santa Marta, Sabanilla, Cartagena, Port au Prince, Kingston, Colón, and New Orleans.

Munson Line (American).—This line enjoys special exemptions and is required to make at least 1 round trip per month to and from New York, Philadelphia, or any other port of the United States on the Atlantic coast, and Tampico, Veracruz, and Progreso, with stops on either trip at Alvarado, Tlacatálpam, Laguna, and other Mexican Gulf ports.

West India and Pacific Steamship Company (English).—This line enjoys special exemptions, making 12 trips per annum with the same itinerary as the Harrison line.

Compañía Transatlántica de Barcelona (Spanish).—This line enjoys special exemptions so long as its steamers touch at Mexican ports. It is required to make 12 trips per annum to and from Veracruz, Frontera, Campeche, Progreso, Tampico, Havana, Corunna, Santander, Cadiz, Barcelona, Havre, and New York, connecting with the other lines of the company.

Atlantic and Gulf of Mexico Steamship Company (American).—This line enjoys special exemptions and is required to make at least 3 trips per month to and from either Mobile or Pensacola and Mexican Gulf ports.

Compagnie Générale Transatlantique (French).—This line enjoys special privileges and makes 12 trips per annum according to schedule, touching at Veracruz, several of the West India islands, Havre, St. Nazaire, and Bordeaux.

Knot's Prince Line (English).—This line enjoys special exemptions and is required to make at least 2 monthly trips to and from Antwerp and Glasgow, Progreso, Veracruz, Tampico, New Orleans, Barcelona, Genoa, Marseilles, and Leghorn, with the privilege of touching at Laguna, Coatzacoalcas, Minatitlán, and Tuxpam.

Compañía de Navegación en los Rios de la Costa de Sotavento de Veracruz (Mexican).—This line enjoys a subsidy of \$6,600 per annum

and is required to make at least 20 monthly trips on the Papaloápam, San Juan Michoapam, and Alonzo Lázaro rivers as per contract.

Compañía de Navegación en los Ríos Grijalva, Usuinacinta and Palizada (Mexican).—This line has a subsidy of \$9,000 per annum and is required to make 9 trips per month on the rivers named.

Vapores Correos Mexicanos de Romano Berreteaga (Mexican).—This line enjoys special exemptions and makes 1 trip per month between Veracruz, Coatzacoalcos, Frontera, Laguna, Campeche, Progreso, and to Tampico and intermediate points.

Compañía Industrial de Transportes (Mexican).—This line receives a subsidy of \$75 for round trip and is required to make 72 trips per annum on the rivers Gonzalez and Mezcalapa.

Compañía Colonizadora de la Costa Oriental de Yucatán (Mexican).—This line has received special grants and is required to make 3 round trips per month to and from Progreso, Holbox, and Isla de Mujeres.

Pacific Mail Steamship Company (American).—This line receives a subsidy of \$1,250 per month and is required to make 2 monthly trips. It connects all the ports of the Pacific coast of México with San Francisco on the north, with Central American ports on the south, and also connects with a New York service via Colón.

Compañía del Ferrocarril Occidental (Mexican).—This line receives a subsidy of \$3,500 per round trip, being required to make 18 trips yearly between Guaymas, La Paz, Altata, Mazatlán, San Blas, Manzanillo, Acapulco, Puerto Angel, Salina Cruz, Tonalá, and San Benito.

Lower California Development Company (English).—This line receives a subsidy of \$150 per round trip during the continuance of the contract and is required to make 72 trips per year between San Diego, Todos Santos, and San Quintín.

Pacific Coast Steamship Company (American).—This line also receives a subsidy amounting to \$150 per round trip, the service required being at least 1 monthly trip between San Francisco, Cal., and Guaymas, touching at Ensenada de Todos Santos, Bahía de la Magdalena, San José del Cabo, Mazatlán, and La Paz.

Johnston Line (American).—This line enjoys special exemptions and makes 2 trips per month between New York, Baltimore, Veracruz, and Tampico.

The Mexican steamers *Yaqui* and *Topolobampo*, belonging to Luis A. Martinez, receive a subsidy of \$200 each per round trip and are required to make 3 trips per month between Guaymas, La Paz, Topolobampo, and intermediate points.

The Mexican steamer *Don Lorenzo*, belonging to Luis E. Torres, receives a subsidy of \$100 per month, 5 monthly trips being required for the service between Médano, Huamuchil, Pótam, Torin, Bácum, and Cócont.

There are other lines of importance which ply in Mexican waters, but enjoy no privileges whatever. Among these lines are:

Morgan Line: Steamers leave Morgan City, La., for Veracruz, stopping at New Orleans, Galveston, and Matamoros twice a month.

Maldonado Company, which makes from 12 to 30 trips yearly between New York and Progreso, and New Orleans and Progreso.

Steamers *Campechano* and *Ibero* make monthly trips between Veracruz and Progreso, stopping at Frontera, Laguna, Champotón, Campeche, and Celestun.

Royal Mail Steam Packet Company (English), making 24 trips annually between Veracruz and English ports.

Hamburg-American Packet Company (German), touching once or twice a month at Veracruz for European ports.

The Sonora Railway Company runs two steamers twice a month between Guaymas, La Paz, Santa Rosalía, Agiabampo, Topolobampo, Mazatlán, Perihuate, San Blas, and Manzanillo.

A great number of concessions have been granted by the Government since 1897 to companies purposing to establish new steamship lines on both coasts, all of which promise to add greatly to the efficiency of the service between the ports on their respective itineraries.

The Mexican Government has spared no effort to add, in every way possible, to the efficiency of the postal service of the Republic, and at times this has been a very onerous task. In 1885 the Government was confronted with a large disproportion between the receipts and expenditures in the service, being indebted in large amounts to publishers of periodicals,¹ mail contractors, and to nations with which México had accounts connected with the transport of mail matter. These debts have all been paid up and the service is to-day in a flourishing condition, and, though not a source of revenue to the treasury, is at least able to pay its own expenses.

Prior to 1877 there were throughout the entire Republic but 53 central and 269 branch post-offices; in 1887 the number had risen to 313 and 685 respectively; in 1894, to 483 and 974; in 1895, to 475 and 974, while on December 31, 1897, the service was represented by 523 central stations, 1,091 branch offices, and 19 substations.

The compilation of regular postal statistics in the Republic dates from 1893-94, the basis of which was the postal movement of a month of 28 days multiplied by 13, the result not giving correct figures. Mexican figures show that the number of pieces of mail matter handled by the postal authorities of the country amounted in 1878-79 to 5,992,611; in 1888-89 to 27,429,081; in 1892 to 122,821,359, while in 1894-95 the number is given as 24,773,636 only. This apparent fall

¹ Under the Mexican regulations postmasters act as collectors of subscriptions and advertising bills, etc., due the publishers of newspapers.

ing off is due to the fact that in the years preceding 1894-95 the entire postal movement, that is, mail matter received and sent out, was included in the estimate, while for the latter period only such matter as was sent out was reckoned.

From 1894-95 to 1896-97 the movement has been as follows:

First-class (letters) and registered matter:	Pieces.
1894-95.....	24, 773, 636
1895-96.....	30, 467, 229
1896-97.....	29, 887, 705
Printed matter, samples, and postal parcels (second, third, fourth, and fifth classes):	Kilograms.
1894-95.....	1, 107, 755
1895-96.....	1, 922, 741
1896-97.....	1, 711, 778

The revenues and expenditures for the Mexican postal service from 1887-88 to 1894-95, according to the latest available official data, were as follows:

Years.	Revenues.	Expenditures.
1887-88.....	\$805, 434	\$905, 318
1888-89.....	894, 007	1, 013, 505
1889-90.....	1, 018, 076	1, 072, 376
1890-91.....	1, 098, 298	1, 148, 032
1891-92.....	1, 142, 181	1, 211, 226
1892-93.....	1, 171, 890	1, 219, 499
1893-94.....	1, 184, 331	1, 204, 317
1894-95.....	1, 358, 326	1, 268, 343

México was a party signatory to the Universal Postal Convention of Paris on June 1, 1878, and has since entered into conventions and parcel-post agreements with the following nations in the manner indicated:

United States.—Postal convention, April 4, 1887; convention for the exchange of parcels containing merchandise through the mails, April, 1888; regulations governing these two conventions, December 29, 1888; regulations governing fiscal officers in connection with postal authorities (in fulfillment of the postal treaty of April 28, 1888), December 30, 1888.

Germany.—Parcels-post convention, May 24, 1892.

France.—Parcels-post convention, December 10, 1891; regulations governing the same, January 22, 1892.

Great Britain and Ireland.—Parcels-post convention, February 15, 1889; regulations governing the same, March 12, 1890; regulations governing fiscal officers in connection with postal authorities, in the fulfillment of the postal treaty of March 12, 1890.

Among the other improvements introduced in the postal service of the Republic may be mentioned the postal money-order system, the limit in some post-offices being \$30 and in others \$100.

During the year 1899 there were 545 post-offices in the Republic, 1,225 postal agencies, and 96 railway post-offices, making a total of 1,886 offices. There were 2,529 post-office clerks, 990 messengers, and 4,437 carriers, making a total of 7,956 employees. The extent of the postal service was 11,664 kilometers by rail, 18,577 by steamer, and 58,605 by ordinary roads, making a total of 88,846 kilometers. The receipts for the year were \$1,595,818.56, being \$1,033,427.61 in excess of the receipts for the years 1878 and 1879. The amount of mail matter carried during last year was 122,617,116 pieces, an increase of 116,024,483 in twenty years.

CHAPTER XV.

PUBLIC LAND—COLONIZATION AND IMMIGRATION LAWS.

México may be divided into three regions, which the *Mexican Financial Review* calls, respectively, the *hacienda* country, the *pueblo* country, and the free country.

The first-named comprises the greater part of the central plateau, many of the temperate valleys situated on the slopes or terraces of this plateau, nearly all of the Gulf coast, and many points on the Pacific.

The *pueblo* or community holdings lie toward the southern part of the country.

The free country, or public lands, so called because of the fact that few if any *haciendas* or *pueblos* exist there, is situated in the north of the Republic.

As regards the central plateau, it is really marvelous that its lands retain their fertility, considering their great productiveness, for hundreds of years. The only way this can be accounted for is that the system of irrigation there in vogue yearly resupplies the soil with natural fertilizing matter.

Previous to the conquest this very land had to provide food for at least twice the existing population of the country, and was producing for more than six centuries unceasingly and without fertilizers. Strange, indeed, then, that it has not become sterile. But it is said that the day is fast approaching when the fecundity of this soil will vanish. Dryness and barrenness are already becoming evident in certain portions of the table-lands; but irrigation companies are being organized steadily, and will undoubtedly prevent this undesirable tendency.

The almost virgin land, and that which invites the energetic arm of the careful husbandman, lies on the east and on the west, toward the coasts, and when the railroads now being constructed shall have united one and the other points many fertile valleys will be in a position to bring forth two and three crops a year.

The free, or public, lands are situated mostly in parts of the States of Chihuahua, Coahuila, Durango, Sinaloa, and Sonora. Immense tracts are here almost uninhabited, and in the western Sierra Madre the plains reach down to the Tropics. These lands were formerly settled upon by religious orders, or were held by officers of the Spanish

Crown. After the war of independence and the escheating to the State of ecclesiastical holdings they became public lands, and are what are now called *terrenos baldíos*. The nation, under laws to that effect enacted on July 20, 1863, and March 26, 1894, is having these lands surveyed and measured, giving to the companies doing the surveying one-third of the land surveyed, and disposing of the rest, some gratuitously to towns, as commons, and to private parties and companies at fixed rates. Some 28,211,607 acres have thus been disposed of since 1867 up to December 31, 1895, and the Government still retains in the neighborhood of 25,000,000 acres. For the lands sold the public treasury has received \$2,508,849.04 up to the date mentioned. From July 1 to December 31, 1897, there were public lands sold in eight States, under the two laws referred to, to the extent of 90,858.67 acres, producing \$30,755.13.

The land in the north is generally laid out in squares containing from 4,000 to 6,000 acres.

The climate of this section greatly resembles that of the south of Europe, and is well adapted to colonization.

As has been said, the pueblo system prevails nearly everywhere in the south of the country.

The great question in México has been, and to a considerable extent still is, water. The country, excepting the lowlands of the Gulf, is dry, and has been likened to Algeria and Egypt.

The last law relating to the occupation of public lands was promulgated on March 26, 1894 and is in substance as follows:

All lands in the Republic are considered as public (*baldíos*) which have not been utilized for public purposes nor legally ceded to individuals or corporations authorized to receive them.

Every inhabitant of lawful age and contractual capacity of the Republic has the right to denounce or preempt public land in any part thereof, to an unlimited extent, except natives or naturalized citizens of bordering nations, who can not through any title acquire land in any State or Territory bordering on their country. The privilege hereby granted in nowise repeals the limitations of laws now or hereafter to be enacted relating to the acquisition of real estate by aliens.

The Executive shall establish, by decree to be published in January of each year, the schedule of prices of public lands in each State, the Federal District, and the Territories. This schedule shall remain in force during the fiscal year next succeeding its publication.

The following lands can not be alienated through any title whatsoever:

1. The seashores.
2. The shore lines extending 20 meters back of high-water mark along the coasts of the mainland and islands.
3. A strip 10 meters wide along each bank of navigable rivers and 5 meters wide along the banks of smaller streams capable of floating any marketable substance.

4. Lands having monumental ruins, together with the ground that may be declared necessary for their care and preservation.

The denouncing of public lands must be made before the agent of the Department of Promotion within whose jurisdiction the land is situated.

Within fifteen days after the filing of the necessary petition, the agent must investigate whether the land has been surveyed or is reserved for forests, colonies, or settlement of Indians, or otherwise.

Every denouncement must be published in the office of the agent, the official paper of the State, District, or Territory where the land is situated, at the expense of the denouncer, at whose expense also the survey of the land is to be made by an expert engineer to be named by him with the approval of the agent.

The survey and the plat of the land having been made and no protest having been filed, the agent will make copies of the record and plat and transmit the same to the Department of Promotion, through the governor of the State in question, for inspection.

Should the Department find the record, plat, etc., unobjectionable, it will adjudicate the land in favor of the denouncer and notify him to pay the price thereof.

This price is that fixed by the schedule in force at the time the denouncement is made, and must be paid within two months after notification. If this term should expire without proof of the payment having been received at the Department, the denouncer loses the rights he may have acquired; otherwise the patent will be delivered to him.

Should any protest be interposed, the matter will be carried to the court of the district within whose jurisdiction the land is situated, to try the issues. In such suits the district attorney will represent the Government. Suits of this character act as a stay of all administrative action until final judgment is delivered.

Under the law, as given in substance above, the Secretary of Promotion publishes every year the prices at which Government lands may be purchased. In pursuance thereof the prices for such lands for the year 1900-1901 have been published. The following table gives the price per hectare (2.471 acres):

States and Territories.	Price.	States and Territories.	Price.
Aguascalientes	\$2.00	Oaxaca	\$1.10
Campeche	1.75	Puebla	3.00
Chiapas	2.50	Querétaro	2.00
Chihuahua	1.00	San Luis Potosí.....	2.25
Coahuila	1.00	Sinaloa	1.00
Colima	1.00	Sonora	1.00
Durango	1.00	Tabasco	3.00
Guanajuato	2.00	Tamaulipas.....	1.00
Guerrero	1.10	Tlaxcala	2.00
Hidalgo	2.25	Veracruz	2.50
Jalisco	2.00	Yucatán	2.00
México	2.50	Zacatecas	2.00
Michoacán.....	2.75	Federal District	2.60
Morelos	4.00	Territory of Tepic	2.25
Nuevo León.....	1.00	Territory of Lower California .....	.50

The price is not payable in cash but in bonds of the national debt, the value of which varies from time to time, the tendency for the past three years being decidedly upward.

México has made sacrifices to induce people to its shores, but its efforts in this behalf have not caused any considerable influx of foreigners to the country. Mexicans attribute this state of things to two causes, viz, the fact that free land is situated at a considerable distance from means of communication, and that the country is not so devoid of native population as is generally supposed. The Indian lives on very little and can therefore afford to work for such paltry wages that foreign immigrants can not compete with him. When the general state of the country shall be such as to create a voluntary current of immigration, it is confidently believed that the Republic will reap the reward of its sacrifices, for it is a country where the immigrant, under the colonization laws, has the smallest amount of taxes to pay.

The first steps taken in the direction of inducing aliens to seek México's fertile fields date back to 1827. In the year 1821 a law was enacted entitled "Prosperidad General" (general prosperity), in which special reference is made to the rapid growth of the foreign colony in the State of Texas. In the year 1846 the then Minister of Foreign Affairs, José M. Lafragua, presented a plan for legislation to Congress in which, *inter alia*, he spoke of "the neglect of colonization as a crime of high treason," and held out the flattering but delusive hope of establishing innumerable colonies to contain at least 50,000 persons. During the imperial period Señor Robles submitted to Congress plans of the same sort, as did also Señor Balcárcel in 1868, and Señor Riva Palacio in 1877; but up to 1882 no really serious practical efforts were made to attract immigration, and the results obtained up to the present are comparatively insignificant.

The colonization law now in force was enacted and promulgated on the 15th day of December, 1883. It comprises four chapters and thirty-one articles, the former being entitled, respectively, "Of the survey of lands;" "Of colonists;" "Of companies;" "General provisions."

The provisions of this law are, in substance, as follows:

For the purpose of securing lands suitable to the establishment of colonies, the Executive will cause the waste or Government lands in the Republic to be surveyed, measured, subdivided, and appraised, appointing to this end the corps of engineers he may deem necessary, and determining the methods to be followed.

No subdivision shall in any case exceed 2,500 hectares (about 6,177 acres) in extent, this being the greatest amount of land which shall be conveyed to any one individual of lawful age and legal capacity.

The lands surveyed, measured, subdivided, and appraised may be conveyed to foreign immigrants and inhabitants of the Republic who

may desire to establish themselves thereon as colonists, under the following conditions:

(1) By purchase, at the price set by the engineers and approved by the Department of Promotion, payable in ten years in equal installments, the first becoming due two years after the establishment of the colony.

(2) By purchase, the price being paid on entry, or in installments on shorter time than that provided in the preceding section.

(3) By gratuitous concession, when requested by the colonist; but in this case no cession shall exceed 100 hectares (about 247 acres), and the colonist shall receive no title to the same until he shall have shown that he has retained the land in his possession, and has wholly cultivated it, or to an extent not less than one-tenth of the whole for five consecutive years.

So soon as there shall be lands suitable for colonization under the conditions herein provided, the Executive shall determine which should be settled at once, publishing the plats thereof and the prices at which they shall be sold, endeavoring in every case that the sale or gratuitous conveyance shall be of alternate sections. The remaining sections shall be reserved to be sold under the conditions prescribed by the law when they shall be sought, or when the Executive shall so determine, the Executive being empowered to mortgage them for the purpose of raising funds which, added to the proceeds of the sale of sections of land, shall be exclusively destined to the carrying out of colonization.

To be considered as a colonist and to be entitled to the privileges conferred by this law it is necessary that the colonist, in case he is a foreigner, shall come to the Republic provided with the certificate of the consular or immigration agent, issued at the request of the said immigrant, or of the company or corporation authorized by the Executive to bring colonists to the Republic.

Should the petitioner reside in the Republic, he must apply to the Department of Promotion, or to the agents authorized by the said Department to admit colonists to the colonies, which shall be established in the Republic.

In every case petitioners must present certificates of the proper authorities setting forth their good character and their occupation previous to petitioning for admission as colonists.

Colonists settling in the Republic shall enjoy for the period of ten years, counting from the date of their establishment, the following privileges:

(1) Exemption from military service.

(2) Exemption from all taxes except municipal.

(3) Exemption from all import or domestic duties on articles of consumption not produced in the country, agricultural implements, tools,

machines, outfits, building materials, household furniture, and animals for breeding purposes, and thoroughbreds for the use of the colonies.

(4) Exemption, personal and nontransferable, from export duties on the products of cultivation.

(5) Premiums on praiseworthy productions, and prizes and special protection for the introduction of new agricultural interests or industries.

(6) Exemption from fees for the certification of signatures and issuing of passports delivered by consular agents to parties coming to the Republic as colonists by virtue of contracts entered into between the Government and any company or companies.

The Department of Promotion shall determine the number and kind of articles which in each case shall be admitted free of duties, and the Finance Department shall regulate the manner of admission to prevent fraud and smuggling, but without retarding the prompt dispatch of the said articles.

Colonists settling on lands barren of trees, and who shall prove, two years previous to the lapse of the period of exemption, that on a portion of their section, which shall not be less than one-tenth thereof, they have laid out trees to a number proportionate to the land planted on, shall be exempt from taxes on the whole land for one year longer, and, in general, shall have exemption for one year further for each tenth part of their land so laid out.

The colonies shall be established under the municipal jurisdiction, subject, as regards the election of their authorities and the levying of taxes, to the general laws of the Republic and the laws of the State wherein they are established. The Department of Promotion may, however, appoint agents in said colonies for the purpose of better directing their labors and exacting the payment of the amounts which may be due to the Federation for any titles conveyed.

Colonists are required to carry out their contracts with the Federal Government, or with the individuals or companies transporting or establishing them in the Republic.

Every alien immigrant settling in a colony shall, at the time of such settlement, declare before the Federal colonization agent, notary, or proper judicial officer, whether he proposes to retain his nationality, or desires to embrace Mexican citizenship, conceded him by the third section of article 30 of the Constitution of the Republic.

Colonists shall be vested with all the rights and obligations which to Mexican and foreigners, under like circumstances, are conceded and imposed by the Federal Constitution, besides the temporary exemptions conceded by this law; but all questions arising, of whatever character, shall be subject to the decisions of the courts of the Republic, to the absolute exclusion of all foreign intervention.

Colonists abandoning, without due cause, for more than a year, the

lands which shall have been sold them shall forfeit the right to said lands and the amounts they may have paid therefor.

The right to a gratuitous title shall be forfeited by abandonment of the land or failure to cultivate it for more than six months without good cause.

One section shall be ceded without cost, in localities designed by the Federal Government for new settlements, to Mexican or foreign colonists desiring to found the same; but they shall not acquire the title to said section until they shall show that within two years from the foundation of the settlement they have erected thereon a house, forfeiting the right to said title in case of failure to so build. It is the purpose to cede such sections alternately.

The Executive is empowered to aid colonists or immigrants, within the appropriations to that effect made, whenever he shall deem it advisable, by furnishing them expenses of transportation for themselves and their baggage by sea and in the interior to the terminus of the railroad lines; he may further furnish them with free subsistence for fifteen days, and no more, in the localities he may approve, and also with tools, seeds, building materials, and animals for work and breeding; these latter advances, however, shall be repaid in the same manner as the price of the lands.

The Executive may authorize companies to open up (*habilitar*) waste lands by measuring, surveying, subdividing into sections, appraising and describing the same, and to transport colonists and establish them on said lands.

For the purpose of obtaining the necessary authorization companies shall designate the waste lands they propose to occupy, their approximate extent, and the number of colonists to be settled upon them within a given time.

The proceedings incident to the demarkation or survey shall be authorized by the district judge within whose jurisdiction the waste land to be surveyed is situated, which done, and there being no adverse claimant, the record will be delivered to the company to be presented to the Department of Promotion, where the other formalities demanded by this law must be complied with. Should an adverse claimant present himself the case will be tried as hereinafter provided, the representative of the Federal Treasury being a party thereto.

In return for the expenses incurred by the companies in opening up waste lands, the Executive may cede them not more than one-third of the land thus opened up, or its value in money, but under the express conditions that they are not to convey such lands so conceded to foreigners not authorized to acquire them, nor in greater quantities than 2,500 hectares, under pain of losing, in each case, the portions of land so conveyed in violation of said conditions, which portions shall at once become the property of the nation.

Lands surveyed by the companies, excepting such as may be ceded to the same in return for expenses incurred in opening them up, shall be conveyed to colonists, or be reserved under the conditions before mentioned.

Any authority conferred by the Executive for opening up waste lands shall be void and nonextendible whenever work thereon shall not have been commenced within the term of three months.

The Executive may contract with companies or corporations for the introduction into the Republic and the establishment therein of foreign colonists or immigrants under the following conditions:

(1) The companies shall fix the exact time within which they will introduce a determined number of colonists.

(2) The colonists or immigrants shall fulfill the conditions hereinbefore prescribed.

(3) The bases of the contracts the companies may make with the colonies shall conform to the provisions of this law, and shall be submitted for approval to the Department of Promotion.

(4) The companies must guarantee to the satisfaction of the Executive the carrying out of the obligations assumed in their contracts, which contracts must name the causes in which forfeiture and fines shall be imposed.

Companies contracting with the Executive for the transportation to the Republic and settling therein of foreign colonists shall enjoy, for a term not to exceed twenty years, the privileges and exemptions following:

(1) The sale on long time and at low price of waste or Government lands for the exclusive purpose of colonizing the same.

(2) Exemption from taxation, except the stamp tax on capital invested in the enterprise.

(3) Exemption from port dues, except such as are set aside for harbor improvements, to all vessels that, on the company's account, shall carry ten families, at least, of colonists to the Republic.

(4) Exemption from import duties on tools, machines, building materials, and animals for work and breeding which shall be exclusively destined for an agricultural, mining, or industrial colony whose establishment shall have been authorized by the Executive.

(5) Premiums for each family established, and a second premium for each family disembarked; premiums for each Mexican family established in a foreign colony.

(6) Transportation of colonists at the expense of the Government on subsidized steamship and railroad lines.

Foreign colonization companies shall be considered as Mexican, being required to have a legal domicile in one of the cities of the Republic, without prejudice to their having one or more abroad, and they are bound to have at all times a local board of directors, and one

or more attorneys de facto, fully empowered to treat with the Executive.

All questions arising between the Government and the companies shall be decided by the courts of the Republic and according to its laws, without any intervention whatever on the part of foreign diplomatic agents.

Private parties setting aside any portion of their lands for the purpose of colonizing them with not less than ten families of foreign immigrants are entitled to have the same, enjoy equal privileges and exemptions with the colonies established by the Federal Government whenever they shall conform to the conditions imposed by the Executive to assure the success of the colony, and whenever among said conditions shall be one requiring said colonists to acquire, by purchase or cession, one section of land for cultivation.

The Executive may provide private parties with foreign colonists by stipulating with them the conditions under which they are to be established, and may aid them by furnishing the expenses of transportation of said colonists.

The colonizing of the islands in both oceans shall be done by the Executive, subject to the provisions of this law, the Government reserving on each island 50 hectares of land for public use. In case the island should not have the superficial area necessary for the reservation herein specified, no sale of land shall be made thereon, and said land may only be rented on short terms.

Colonies established on islands shall always include Mexican families to a number not less than one-half of the total colonist families.

The Executive is authorized to acquire, by purchase or cession, private lands, whenever he shall deem it expedient to establish colonies thereon, subject, however, to the appropriations to be made for this purpose.

The question of inducing aliens to settle in México has awakened not only the interest of the General Government, but some of the State governments have given it much time and thought. Foremost among these is the government of the State of Veracruz. On the 25th of December, 1885, the legislature of this State passed a law founded upon that quoted on the preceding pages. This law authorized the governor to enter into contracts with owners of suburban landed property for the purpose of colonizing it under the law. All such owners entering into a contract are entitled to a rebate on their taxes at the rate of \$5 for every family settling on their lands who shall engage in agricultural and kindred pursuits. Owners of suburban lands receive a premium of \$5 for every 15 foreign families established on their lands as colonists for an uninterrupted period of three years. Premiums are likewise offered for every new industry established in such colonies, and to the colonist showing the largest

area of land under cultivation. Many exemptions from taxes and contributions are granted. Every colony of 15 or more families definitely established in any locality in the State is entitled to organize its own local police in accordance with law, and to solicit of the Government a subvention to carry out such public works as may be deemed necessary in the interest of the colony.

Notwithstanding the inducements offered by this law, the total foreign population of the State of Veracruz at the beginning of the year 1896 was only 4,277, of which 390 were Americans, distributed over 18 cantons.

Under the first-quoted law of the General Government, thirty-four colonies have been founded up to October 19, 1897. The colonies, their names, location, etc., as furnished by the Bureau of Statistics of the Mexican Republic under the above date, here follow:

Colonies founded by the Federal Government.

Name of colony.	Location.		Number of colonists.		
	District, etc.	State.	Mexi- caus.	For- eigners.	Total.
Portirio Díaz.....	Juarez.....	Morelos.....	294	11	305
Fernandez Leal.....	Cholula.....	Puebla.....	8	437	445
Cárlos Pacheco.....	Tlatlanqui.....	do.....	21	81	102
Manuel Gonzalez.....	Huatusco.....	Veracruz.....	46	378	424
Diez Gutierrez.....	Ciudad del Maiz.....	San Luis Potosi.....	283	63	346
Aldana.....	Municipalidad de México.	Distrito Federal.....	21	89	110
Serieicultora.....	Tenancingo.....	México.....	112	.....	112
Tecate.....	Distrito Norte.....	Baja California.....	210	.....	210
La Ascensión.....	Bravos.....	Chihuahua.....	1,218	.....	1,218
San Pablo Hidalgo.....	Juarez.....	Morelos.....	208	.....	208
San Vicente Juarez.....	do.....	do.....	128	.....	128
San Rafael Zaragoza.....	do.....	do.....	278	.....	278
Jiscoo.....	Comitán.....	Chiapas.....	40	.....	40
Total.....	.....	.....	2,867	1,059	3,926

Colonies founded by authorized companies and persons.

Name of colony.	Location.		Number of colonists.		Name of companies and concessionaires.
	District, etc.	State.	Mexican.	For- eigners.	Total.
Oaxaca.....	Moctezuma.....	Sonora.....	80	114	Juan Fencobio and Emilio Koseritzky.
Vega de San José.....	Costa Oriental.....	Yucatan.....	.....	120	Faustino Martinez & Cia.
Justrez.....	Bravos.....	Chihuahua.....	177	395	Cia. Mexicana de Colonización y Agricultura de Chihuahua.
Diaz.....	do.....	do.....	221	334	Do.
Pacheco.....	do.....	do.....	87	244	Do.
Pacheco.....	do.....	do.....	46	168	Do.
Pacheco.....	do.....	do.....	.....	48	Andrew J. Stewart.
Hidalgo.....	do.....	do.....	120	28	Northwestern Colonization and Improvement Company of Chihuahua.
Las Palomas.....	do.....	do.....	.....	48	Marians Garza.
García.....	Guerrero.....	do.....	.....	66	Do.
Mariano.....	do.....	do.....	131	681	Do.
Inmounada.....	do.....	do.....	103	103	W. Fredrick Cloete and Robert R. Symon.
Ranchos Agrícolas.....	Mouclova.....	Cochula.....	21	128	Cia. Agrícola Colonizadora del Tlaxiualilo.
Tlaxiualilo.....	Maptut.....	Purango.....	21	103	Cia. de Colonización de Metlatocoyuca.
Metlatocoyuca.....	Ruachinango.....	Puebla.....	11	8	Cia. del Crédito Fonder de Simala.
Topolobampo.....	El Fuerte.....	Sinaloa.....	11	8	Jesus Almada Hernandez.
Navolato.....	Culiacán.....	do.....	89	193	Cia. Mexicana de Terrenos y Colonización.
Carlos Pacheco.....	Encarnada de Todos san- tos.....	Baja California.....	28	76	Lower California Development Company, Limited.
Romero Rubio.....	Norge.....	do.....	416	88	Forcedo Noriega, Gerente de la Sociedad "La Sangua."
El Progreso.....	do.....	Tamulipas.....	.....	88	Viscount Takaki Enomoto.
Escuintla.....	do.....	Chiapas.....	22	22	Luc Salcedo.
Patia.....	Puequero.....	Michoacán.....	1,780	2,361	4,141
Total.....					

As will be seen by reference to the above tables the total of colonists was then 8,017, nearly one-half of whom are aliens. In 1890 there were only 18 colonies, with 6,524 inhabitants. Five of these colonies are no longer in existence, and in very rare instances have the remaining settlements increased in colonists.

The colonies of Escuintla and Patria have been recently founded, the former being composed entirely of Japanese.

A concession was recently granted for the colonizing by Choctaw Indians of the district of Zitácuaro in Michoacán, and it is expected that 50 families will soon settle there. The International Land and Colonization Company has a government concession to colonize lands in the above section of the country.

The Cárlos Pacheco colony is situated about 100 miles south of San Diego, Cal., and maintains rail, telegraphic, and telephonic communication with it.

The Sericicultora colony of 112 Mexicans in the State of México is devoted exclusively to the cultivation of silkworms.

One of the Mexican colonization agents will settle between 115 and 120 Mexican families from Texas comprising 500 persons, or thereabouts, in the State of Tamaulipas, about 12 miles from Victoria. These families will be recruited from Luling, Corpus Christi; Prairie Lea, Taylor, Gonzales, etc. The colony was to be established in January, 1898, and each family to receive 100 acres each.

The Department of Promotion, on October 18 and 20, 1897, respectively, entered into two more contracts for the establishment of colonies in Simojovel, Chiapas, and the District of Bravos, Chihuahua. The former locality is to be settled by 10 families from the Basque provinces in Spain and 35 Mexican families, to devote themselves to agriculture. The latter colony will comprise 75 per cent of European and 25 per cent of Mexican families.

CHAPTER XVI.

EDUCATION—RELIGION—PROTESTANT MISSIONS.

Education in México has been for many years the subject of serious consideration on the part of the Government, on account of the difficulty experienced in combating the conservative ideas prevailing in the Republic. The main obstacles have, however, been overcome, and the country to-day enjoys the benefit of a liberal system of education, which is administered under three branches—gratuitous, lay, and obligatory. Laws have been enacted, normal schools for both sexes have been established, and in order to still further extend the benefits to be derived from a uniform educational system throughout the whole country, the Government convoked the various States for a National Congress of Education. The labors of this congress resulted in the grading of educational facilities from primary or children's schools to higher grades and special institutions of learning; the preparation of general plans of study for all grades; the division of the subjects taught into annual courses; also provided for the unrestricted selection of the latest and most improved methods of instruction suitable to each grade; and, in short, for the examination and choice of whatever systems, either technical or administrative, which might be deemed suitable to the ends for which the congress was convened.

The Executive at that time laid before Congress the plan of a reform of the law of March 21, 1891, placing elemental tuition under the care of municipalities and obliging them to establish at least one school for each 4,000 inhabitants. This law obtained the approval of Congress, and by virtue thereof the municipal schools of the Federal District and of the Territories came under Federal jurisdiction. The superior board of primary education (*Dirección Superior de Instrucción Primaria*) was also created for the reorganization, superintendence, and management of said institutions.

The law making education compulsory was promulgated March 23, 1888, but its enforcement was not decreed at that time, and the first Congress of Public Education was convened for the purpose of adopting such measures as should tend to establish an efficient and uniform system of education. This congress met on December 1, 1889, and closed its sessions on March 31, 1890, after having passed on and approved 124 questions, the principal being the establishment of a national system of popular education based on the uniformity of obligatory, gratuitous, and laical primary education, children from 6 to 12

years of age to be given an elementary primary education embracing four courses or scholastic years. The general programme for elemental primary obligatory education embraces practical morals, civic or laical instruction, the national language (including writing and reading), object lessons, arithmetic, the principles of physical and natural sciences, geography, history of the country, practical notions of geometry, drawing, singing, gymnastics, and for girls, sewing, etc. Resolutions were passed relating to rural schools, itinerant teachers, kindergartens, etc., and it was declared indispensable that education for adults should be provided for in cases where persons had been unable to receive instruction during childhood. Education was also declared compulsory in soldiers' barracks, jails, penitentiaries, and institutions of correction. Superior primary education was declared compulsory for students desiring to enter preparatory and professional schools which did not exact a secondary education, the period required for this branch being two years. Several other measures of similar import were also passed.

A second congress was convened on December 1, 1890, which solved certain problems on compulsory elemental education, fixed the methods to be followed in the schools of superior primary education, and settled matters pertaining to normal schools, preparatory education, and special schools. As the result of this congress, the law of March 21, 1891, was enacted, regulating compulsory education in the Federal District and the Territories of Tepic and Lower California, which law became effective on January 17, 1892.

The primary schools previously supported by the Government were those which were under the care of the *Compañía Lancasteriana*, which, since 1822, had been working earnestly and unceasingly for gratuitous public education. The methods employed, though formerly excellent, had become obsolete, and by the act of March 29, 1890, the Government resolved to bring these schools directly under the protection and jurisdiction of the nation. They were consequently placed under the supervision of the Department of Justice and Public Education, the Treasury being ordered to take charge of all buildings and moneys used in the maintenance of the institutions, as they were in reality the property of the Republic.

On May 19, 1896, the law of public education was promulgated, its salient points being as follows:

Official primary elemental education in the Federal District and Federal Territories was placed under the exclusive control of the Executive; primary superior education was organized as an intermediate educational system between elementary and preparatory instruction. A general board of primary education was created, charged to develop and maintain the same under a scientific and administrative plan. Preparatory education was decreed to be uniform for all pro-

fessions, its extent being limited to the study of such matters as are necessary to the development of the physical and intellectual faculties and the morals of youth, it being further directed that professional education be reorganized, limiting it to technical matters which pertain to the profession or professions to which each particular school is devoted.

By virtue of this law public education ceased to be in charge of the Board of Aldermen (*ayuntamientos*) of the above-mentioned sections. At the time of its promulgation the municipality of México contained 113 schools supported by the Board of Aldermen, 14,246 students being entered on the rolls, with an average attendance of 9,798.

Each State defrays the expenses of public education, either with funds specially appropriated for that purpose or with the municipal funds.

According to statistical data, in 1876 there were throughout the country 8,165 primary schools, with 368,754 students of both sexes. In 1895 Government schools reached the number of 4,056, of which 2,189 were for males, 1,119 for females, and 748 for both sexes; municipal schools numbered 3,394—for males, 1,754; females, 932; both sexes, 708. These comprised 7,380 primary, 32 secondary, and 35 professional schools, the number of students enrolled being 310,496 males and 181,484 females (a total of 491,980), and the mean attendance 338,066. The total cost to the Government and the municipalities for the maintenance of these institutions was \$8,973,738. In the same year private schools to the number of 1,816 were being conducted, 659 for males, 460 for females, and the remainder under a coeducational system. In addition, 276 were supported by the clergy and 146 by associations, the total number of students enrolled being 68,879, of which 40,135 were males and 38,744 females. The total number of private schools was accordingly 2,238, of which 2,193 were devoted to primary education, 34 to secondary instruction, and 11 to professions.

The statistics for 1897, which are the latest available, give the following figures:

Schools.	1896.				1897. ^a			
	Males.	Females.	Mixed.	Total.	Males.	Females.	Mixed.	Total.
Federal and State Governments.	3,322	1,625	905	5,852	3,423	1,554	1,164	6,141
Municipal	1,787	777	654	3,218	1,056	509	388	1,953
Private institutions	671	526	756	1,953	656	472	669	1,797
Supported by the clergy	160	102	41	303	145	94	46	285
Supported by associations	87	74	25	186	59	49	14	122

^a This table has been compiled from data published in the *Anuario Estadístico* for 1896 and 1897. The State of Veracruz and the Territory of Tepic are not represented in 1897, nor are all the schools of the Federal District included.

In 1896 the number of students enrolled amounted to 666,301 for the Federal, State, and municipal schools, there being 439,824 males

and 226,477 females; while in 1897 the number was 584,171, of which 392,320 were males and 191,841 females. Using the figures given in 1896 for Veracruz and the Federal District as identical for 1897, it may be safely assumed that on December 31, 1897, the public schools in México (Federal, State, and municipal) stood as follows:

Number of schools	9,065
Students enrolled	666,787
Average monthly attendance	458,035
Private institutions	2,361
Number of students	92,387
Average attendance	75,857

The total expenditures for the support of Federal, State, and municipal schools amounted in 1897 to \$6,291,000.

In addition to the normal and primary schools, the Government also supports the following institutions: School of jurisprudence, school of medicine, school of agriculture and veterinary instruction, school of engineers, school of fine arts, school of arts and trades for men, and a similar institution for women, school of commerce and administration, National conservatory of music, preparatory school, schools for the blind, for deaf-mutes, reform schools, etc., also 9 museums, and 17 libraries containing from 400 to 159,000 volumes.

Beside the Government institutions above mentioned, there are throughout the country 26 museums, 83 libraries, 32 scientific and literary associations, and 457 periodical publications, the latter being distributed as follows: City of México, 128; State of Aguascalientes, 8; Campeche, 4; Coahuila, 13; Colima, 6; Chiapas, 4; Chihuahua, 19; Durango, 8; Guanajuato, 20; Guerrero, 3; Hidalgo, 3; Jalisco, 39; México, 11; Michoacán, 13; Morelos, 1; Nuevo Leon, 14; Oaxaca, 8; Puebla, 15; Querétaro, 1; San Luis Potosí, 9; Sinaloa, 7; Sonora, 14; Tabasco, 8; Tamaulipas, 21; Tlaxcala, 1; Veracruz, 35; Yucatán, 25; Zacatecas, 9; Territory of Lower California, 4, and Tepic, 6. Of these, 426 are printed in Spanish, 15 in English, 2 in French, 1 in German, 12 in both English and Spanish, and 1 in several languages. There are 45 dailies, 32 semiweeklies, 6 triweeklies, 205 weeklies, 61 issued fortnightly, 70 monthlies, 2 bimonthlies, 1 trimonthly, 10 quarterlies, 1 annual, and 19 not reported.

The prevailing religion in México is the Roman Catholic, the church being governed by a number of archbishops and bishops. The foundation of the church in the country may be said to date back to 1517, in which year Yucatán was discovered by Don Francisco Hernandez de Córdova, a rich Cuban merchant. Córdova, with 110 Spaniards, reached Cape Catoche during April of 1517, and soon gave battle to the inhabitants, killing 15 and capturing 2. The invaders were accompanied by a priest named Alonzo Gonzales, a native of Santo Domingo, who, during the engagement, carried from a heathen temple the idols therein preserved and, the fight ended, made the temple a Christian church, dedicating it under the invocation

of *Nuestra Señora de los Remedios* (Our Lady of Succor), the patron saint of the Spaniards. The two captives, named Melchor and Julián, were purged of their sins, baptized, and made Christians, becoming the first converts of the New World.

Pope Leo X, by bull of January 27, 1518, created the bishopric of Yucatán, appointing to the see the Dominican Fray Julián Garcés, at the time bishop of Cuba, but he never entered his diocese, owing to the Spanish conquest extending at the time into México, and operations in Yucatán being abandoned. On October 13, 1525, Pope Clement VII appointed Garcés to the newly created see of Puebla, under the official title of Bishop of Puebla, Yucatán, Chiapas, and Oaxaca.

The first bishop of México, with the title of bishop-elect and protector of the Indians, was Fray Juan de Zumárraga. This functionary destroyed many of the ancient picture writings of the Aztecs. He arrived in Veraacruz in December, 1528, and was made bishop of México, suffragan to the archbishop of Seville, by bull of September 2, 1530. In 1545 the Mexican bishopric was made independent, and by bull of January 31, 1545, it was erected into an archbishopric, with bishop Zumárraga as archbishop. In the year 1571 the archbishop of México was made primate of New Spain, and on March 16, 1863, Pius IX divided the Mexican church into three archdioceses. These were the eastern, or that of México; the central, or that of Michoacán; and the western, or that of Guadalajara. The various bishoprics of México are suffragan to these archbishoprics.

The Holy Office of the Inquisition founded its first tribunal in the City of México in the year 1571, with Don Pedro Moya de Contreras as Inquisitor-general of New Spain, Guatemala, and the Philippine Islands. The first burning place in the City of México was situated near the Church of San Diego, upon land now included in the Alameda. The first *auto-da-fé* was celebrated in 1574, when, as stated by a chronicler of the day, "twenty-one pestilent Lutherans" were incinerated for the cause of religion.

On May 31, 1820, the inquisition was suppressed forever in México. The last *auto-da-fé* was celebrated on November 26, 1815, the accused being the patriot Morelos, who, having been turned over to the secular authorities, was shot on December 22, 1815. The charge against Morelos was that he was "an unconfessed heretic, an abettor of heresy, and a disturber of ecclesiastical hierarchy; profaner of the holy sacraments; a traitor to God, to the King, and to the Pope."

The finest edifices in the Republic were erected by the Roman Catholics, and it is estimated that up to 1859 one-third of the real and personal property was owned by the church. The cathedrals and churches, convents and monasteries were solidly, massively built, and the interiors of the cathedrals and churches were magnificently decorated, gold and silver being lavishly employed in embellishing them.

The three orders of the Franciscans, Dominicans, and Jesuits were

the most prominent in firmly fixing the power of Spain in México and fostering learning in the land, but the absorption of so considerable a portion of the wealth of the colony by the church, and the blocking of the channels of trade consequent on the locking up of capital, brought about the suppression of religious orders in the Republic. The Jesuits were finally expelled from the country in 1856, and all the remaining orders had been abolished on Mexican territory by December 27, 1860, through the efforts of the Liberal forces, headed by Juarez. The laws of reform, incorporated into the Federal Constitution December 14, 1874, suppressed the last remaining female religious establishments—the Sisters of Charity. “This law left México without a monk or a nun, and so it remains to this day.”

The number of vicarages and parishes, Roman Catholic churches and chapels in México is given in the following table:

Dioceses.	Seat.	Vicarages and par- ishes.	Churches and chapels.	Total.
Archbishopric of México.....	México	203	1,654	1,857
Bishopric of Puebla.....	Puebla	187	2,513	2,700
Bishopric of Oaxaca.....	Oaxaca	134	1,000	1,134
Bishopric of Chiapas.....	San Cristobal.....	40	500	540
Bishopric of Yucatán.....	Mérida	84	234	318
Bishopric of Tabasco.....	San Juan Bautista.....	12	100	112
Bishopric of Tulancingo.....	Tulancingo.....	70	400	470
Bishopric of Veracruz.....	Jalapa	64	100	164
Bishopric of Chilapa.....	Chilapa	75	379	454
Bishopric of Tamaulipas.....	Ciudad Victoria	39	41	80
Archbishopric of Michoacán.....	Morelia	58	300	358
Bishopric of San Luis Potosí.....	San Luis.....	53	171	204
Bishopric of Querétaro.....	Querétaro	29	107	136
Bishopric of León.....	León	23	100	123
Bishopric of Zamora.....	Zamora	36	100	136
Archbishopric of Guadalajara.....	Guadalajara.....	106	376	482
Bishopric of Durango.....	Durango	45	250	295
Bishopric of Linares.....	Monterey.....	36	135	171
Bishopric of Sonora.....	Culiacán	55	200	255
Bishopric of Zacatecas.....	Zacatecas.....	20	100	120
Vicarage Apostolic of Lower California.....	.....	.....	3	3
Total.....	.....	1,349	8,763	10,112

Independence of thought in religion may be said to have had its beginning in México as far back as the year 1770, when Bishop Fabián, of Puebla, under the auspices of Archbishop (afterwards Cardinal) Lorenzana, published his “Missa Gothica seu Mozarabica,” which was a liturgy used in Spain by the Gothic Christians prior to the adoption of the Roman liturgy. Liberal ideas grew very slowly, but received considerable impulse when, in 1824, México gained her independence from the mother country, Juarez and the “laws of reform” further invigorated these ideas, which grew more and more until about 1860, when the first Protestant missionary, Miss Matilde Rankin, commenced her labors in the Mexican field, which resulted in a short time in the formation of fourteen Protestant congregations.

The first movement toward the formation of a Christian church distinct from the Roman Catholic which came to a successful issue was begun in the country in 1868, when aid was asked of Protestants in the

United States. The aid being afforded, there was organized in 1869 in the City of México what was called "The Church of Jesus in México," which, however, was not the result of missionary work so much as "a spontaneous movement originating among members of the Roman Catholic Church" in the country who desired "a greater liberty of conscience, a purer worship, and a better church organization."

The Rev. Henry C. Riley, a clergyman of the Protestant Episcopal Church in the United States, went to México, in 1869, and entered heartily into the work of "The Church of Jesus." In the same year the great church of San Francisco, as well as the chapel of Balvanera, were purchased by the Protestants, and services were conducted therein in Spanish and English.

These buildings, formerly Roman Catholic churches, were purchased at an expense of \$50,000, and in addition to this, during the five years that the society continued in charge of the work, more than \$83,000 were expended in the support of missionaries. More than 3,000 persons connected themselves with the movement, and in 1873 the society deemed it expedient to transfer the work to the board of missions of the Protestant Episcopal Church. Subsequent to this the Rev. Dr. Riley was consecrated bishop of the valley of México; but in April, 1884, after Bishop Riley's resignation, the American bishops recognized the *Cuerpo Eclesiástico*, composed of the clergy and readers, as the ecclesiastical authority of the Mexican Church.

The Church of San Francisco is a historic building; it was dedicated December 8, 1716, but the original monastery and church, whose site this edifice occupied, was built about 1607 on lands which had formerly been the garden and wild-beast house of the kings of Tenochtitlán. Cortés provided funds for the building of the first church, and material was secured in the hewn stone from the steps of the great *Teocalli* (the Aztec temple). In this church Cortés heard masses, and for a time his bones found a resting place. Here the Spanish viceroys, through the centuries, took part in the great festivals of the church. The *Te Deum* in celebration of Mexican independence was first echoed by its walls. Here the liberator, Agustín de Yturbide, worshiped, and here his funeral services were held when he died; and here, to-day, Protestant services are held.

Three churches now stand on portions of the land covered by what were known formerly as the seven churches of San Francisco. They are the Church of Jesus; Christ Church, where the services of the Church of England are held, and the Methodist Episcopal Church of the Trinity.

In 1891 the Mexican Church elected the presiding bishop of the American Church as the provisional bishop of the former, and took as its name "The Mexican Episcopal Church of Jesus." The general convention has commended the church work in México, and since then

the Mexican Church has reorganized itself, substituting for the *Cuerpo Eclesiástico* a synod composed of the clergy and lay representatives from the congregations. It has adopted a body of canons for its government and has also offices for the administration of baptism, confirmation, and communion, for marriage and burial, for daily morning and evening prayer, etc. Two men have been ordained to the priesthood and seven to the diaconate.

The Mexican Episcopal Church is no longer an American mission, although the contributions of American church people are supporting the work.

The church has stations in four States and the Federal District, having a membership of 1,224 and 568 communicants. There are also 348 school pupils. The clergy and workers consist of 8 presbyters, 5 deacons, 6 readers, 6 candidates for orders, 13 teachers, 24 congregations, the Dean Gray school for boys, and the Hooker orphanage.

The provisional bishop is Rt. Rev. John Williams, D. D., LL. D., bishop of Connecticut. The resident representative in México is the Rev. Henry Forrester, who is stationed in the City of México.

The Presbyterian Church also has a mission in México, which was begun in 1874, and has 4 stations, 11 churches, 58 preaching places, 8 missionaries, 3 native preachers, 18 other native helpers, 39 additions to the church, 479 communicants, 2 theological students, 25 pupils in boarding schools, 356 pupils in day schools, and 15 Sabbath schools, with 333 pupils.

The Methodist Episcopal Church South laid its foundation in the City of México in 1873. There are now three mission conferences in México, representing the fruits of unceasing toil and heroic devotion for twenty-four years. They are the Central (organized in 1886), the Northwest (organized in 1890), and the Mexican Border (organized in 1885). Their joint statistics give missionaries, 18; native traveling preachers, 65; members, 5,926; Sunday schools, 125; scholars, 3,363; Epworth leagues, 26; members, 802; organized churches, 114; boarding schools, 2; pupils, 209; day schools, 13; pupils, 332. Total value of mission property, \$78,035. Under the Woman's Foreign Missionary Society there are in the Republic of México 6 boarding schools in successful operation, including 1 in Laredo, on the border. There are 6 day schools, 4 Bible women, and a large force of native helpers, besides the 16 missionaries and 30 teachers.

This church claims that a Mexican, Sóstenes Juárez, was the first man who held Protestant services in México. That in 1865 a band of seven met in a room on the Calle San José Real, in the City of México, and organized the first Protestant church in México. It was called The Society of Christian Friends.

Data kindly furnished by the Missionary Society of the Methodist Episcopal Church show a very flourishing condition of affairs. This

organization has in México 40 churches, 29 parsonages, 1 theological school, 5 high schools, and 48 day schools. It employs 24 missionaries, 90 native preachers, and 65 teachers in its various schools. There are 3,938 church members, 59 Sunday schools with 2,187 scholars, while in the above other schools there are 3,352 students.

The value of the church property, parsonage, and other buildings is about \$214,925.

The society also maintains a publishing house, from which it issues a weekly paper called *El Abogado Cristiano*. During 1896 the house published Sunday school lesson papers, hymnals, tracts, etc., to the number of 9,871,400 pages.

Two distinct missionary organizations of the Baptists of the United States are prosecuting missionary work in México independently of each other, although the best of relations exist between them. These are the American Baptist Home Missionary Society and the Foreign Mission Board of the Southern Baptist Convention.

The latest official report of the former shows that the society has in Mexico 13 churches and 2 schools under its control, with 17 missionaries, 12 of whom are natives. There are about 800 church members, 5 teachers, with an enrollment of about 100 in the schools, 4 church edifices, and 1 parsonage, which, with the grounds, are valued at about \$55,000, gold.

The society also has a printing establishment in the City of México, from which is issued *La Luz*, a semimonthly paper, besides many other publications.

The American Friends Society has missions at Matamoros, City of México, and other places.

The "*Anuario Estadístico*" for 1897 gives to the country 1 Evangelist, 1 Reformed Church, 4 Protestant, and 45 Catholic publications.

When the Protestant missionaries first began their labors in the Mexican field they suffered trials and tribulations innumerable, and some suffered death for their faith; but of late years the Federal Government, as well as the State authorities, see to it that the constitutional right of free conscience is enjoyed by all alike, and, in consequence, Protestantism is spreading and gaining proselytes.

CHAPTER XVII.

PATENT AND TRADE-MARK LAWS.

The first patent law of México was framed and issued in 1832, but it was not until 1886 that any remarkable activity was noted in this branch of development, as in the years intervening between 1832 and 1853 not a single patent was granted. From 1854 to 1875 the entire number issued was only 41; from 1876 to 1885 there were 360; in 1886 102, and from that time until 1889 the patent grants numbered 406.

The patent law now in force was passed on June 7, 1890, and amended June 6, 1896. The number of patents issued under its provisions from date of promulgation to December 31, 1897, according to Mexican official figures, was as follows:

1890	63	1895	154
1891	153	1896	150
1892	168	1897	203
1893	122		
1894	125	Total	1, 138

The patent law of the Republic is as follows:

ARTICLE 1. Any Mexican or foreigner who is the inventor or improver of any industry or art or of objects destined therefor has the right, by virtue of article 28 of the Constitution, to the exclusive use thereof during a certain number of years, under the rules and regulations prescribed in this law.

In order to acquire this right a patent of invention or improvement must be obtained.

ART. 2. Every discovery, invention, or improvement that may have for its object a new industrial product, a new manner of production, or the new application of means already known for the obtainment of a result or of an industrial product is patentable. Chemical or pharmaceutical products may likewise be patented.

ART. 3. An invention or improvement shall not be considered new when in this country or abroad, and prior to the application for the patent, it may have received a sufficient publicity to be put into practice. Excepting, however, the case when the publicity may have been made by a foreign authority empowered to issue patents, and when the invention or improvement may have been presented in expositions held within the territory of the Republic or abroad.

ART. 4. The following can not be patented:

1. The inventions or improvements whose working shall be contrary to the laws forbidding them or regarding public security.

II. Scientific principles or discoveries while they are merely speculative or be not put into practice by means of a machine, apparatus, instruments, mechanical or chemical processes of a practical industrial character.

ART. 5. The granting of a patent does not guarantee the novelty nor the usefulness of the object to which it relates, nor does it solve questions that may arise therefrom. Consequently, it must be granted without previous examination as to the novelty or utility of the invention or improvement, or of the sufficiency or insufficiency of the descriptions that may accompany the petition.

ART. 6. The granting of a patent can only be made with reference to one object or industrial process. When two or more can be combined among themselves to produce the same industrial result application must be made for the number of patents that may be necessary therefor.

ART. 7. The rights granted by virtue of the patents issued in the Republic for objects or processes that may have been or may hereafter be protected by foreign patents are independent of the rights that the latter may convey and of the effects or results incident thereto.

ART. 8. The effects of a patent are:

I. To deprive every person, without permission from the owner of the patent, of the right to produce, through industrial means, the object of the invention, or to place it on the market and from selling it.

II. With reference to a process, machine, or any other manner of working an instrument or other means of operation, the effect of the patent is to deprive others of the right to apply the process or to use the object of the invention without the permission of the owner of the patent.

ART. 9. The patent does not produce any effect whatever as regards a third party that was already secretly working or had made the preparations necessary for working within the Republic the invention or process before the presentation of the patent.

ART. 10. The effects of the patent do not comprise the objects or products that may cross the territory of the Republic in transit or may remain within its territorial waters.

ART. 11. The right of applying for a patent for objects or processes that may be protected by foreign patents can only be granted to inventors or improvers or to their legitimate representatives.

ART. 12. Inventors shall have the period of one year from the date of the patent within which they shall have exclusive right to apply for patents for improvements.

ART. 13. Patents may be granted for 20 years from the date of the issue thereof; nevertheless, when the patents shall be sought for objects or processes already protected by foreign patents the life thereof shall

not exceed the unexpired portion of the existence of the first patent issued to the applicant.

ART. 14. The term of a patent may be extended for 5 years at the discretion of the Executive. The extension of the term of a patent of invention involves the extension of the term of the supplementary patents of improvement relative thereto.

ART. 15. On payment of a fair indemnity the Executive may appropriate a patent on the ground of public policy or by reason of the patented article being of such a nature that its free use is capable of proving an important source of public wealth. However, this can only be done under one of the following circumstances:

I. When the patentee refuses to allow his patent to be worked.

II. When the machine, apparatus, instrument, or process is capable of being produced or used in the country.

The regulations will determine the formalities and procedure to be observed in the appropriation of patents for the public good.

ART. 16. In order to obtain the protection of this law, application must be made in due form to the Department of Promotion in which the authority to grant patents is vested.

ART. 17. The first applicant for a patent shall have in his favor the presumption of being the first inventor, and moreover enjoys the right of possession.

ART. 18. Inventors, whether citizens or foreigners, who are unable to apply personally to the Department of Promotion, may appoint attorneys in fact to act for them, both in obtaining the patent and in lawsuits and other matters relative thereto.

Citizens may appoint an attorney in fact by a common letter of authorization, but foreigners must grant a regular power of attorney duly recorded.

The effects of the powers of attorney cease with the issue of the patent, unless it be otherwise stated in the power.

ART. 19. Applications for the granting of letters patent shall be published in the official journal of the Federal Government during a period of two months, at intervals of ten days.

ART. 20. During the period of time mentioned in the foregoing article interference proceedings may be instituted by any one with a view to prevent the granting of the patent solicited.

After the said period of time has elapsed no proceedings of interference will be allowed.

ART. 21. Interference proceedings can only be instituted on the following grounds:

I. That the alleged invention or improvement is not properly patentable under the provisions of this law.

II. That such alleged invention or improvement has been taken from descriptions, drawing, models, devices, apparatuses, or methods

invented by another, or from processes already reduced to practice by another, or, in general, on the ground that the applicant is not the original inventor or his legitimate assignee.

ART. 22. If two or more persons claim the same invention the first inventor shall be entitled to the patent, but if priority of invention can not be determined the patent shall be granted to the first applicant.

ART. 23. If interference proceedings be instituted, as determined by articles 20 and 21, the Department of Promotion shall summon the parties and endeavor to reconcile their conflicting claims. But if this is unsuccessful the Department shall suspend all further executive proceedings and shall transmit all the evidence in the case to the proper judicial authority. The party instituting interference proceedings shall be allowed two months to make good his action in court, but if he fail to do so within this time his claim shall be disallowed.

ART. 24. All judgments of the judicial authority in the premises shall be transmitted to the Department of Promotion that they may be duly enforced.

ART. 25. The decrees of the Department of Promotion granting a patent can only be canceled by a judicial sentence, and only on the ground of the nullity of the patent.

ART. 26. At the expiration of the two months referred to in article 19, and after the Government tax¹ has been paid into the treasury of the nation, the letters patent shall be issued with reference to the invention or improvement sought, provided always that letters patent covering the same invention have not previously been granted by the Department of Promotion.

ART. 27. Letters patent issued in the name of the nation shall have subscribed thereto the signature of the President of the Republic, be countersigned by the Secretary of Promotion, and bear, besides, the great seal; they must further contain in clear language a description of the discovery or improvement patented.

The letters patent, with one of the copies of the drawings, samples, models, and other matters under seal, together with the documents presented with the application duly certified by the subsecretary, shall constitute the title of the person who may obtain the patent.

ART. 28. Letters patent shall be recorded in a special register wherein the appropriate entries relative thereto shall be made.

ART. 29. All letters patent that may be issued shall be published in the official journal; and, furthermore, every year a special book shall be published which must contain a clear and exact description of the inventions or improvements, as also copies of the drawings.

ART. 30. All inventions protected by letters patent shall bear a mark stating that fact and the number and date of the letters patent.

¹ By executive decree for the years 1897-98 and 1898-99, the Federal tax on patents is \$10 in Mexican money, payable to the Federal Treasury.

Letters patent require the payment of a fee amounting to from \$50 to \$150, payable in Mexican dollars or in bonds of the national consolidated debt.

ART. 32. In case of the extension referred to in article 14, a new fee shall be paid in conformity with the foregoing article.

ART. 33. The owner of a patent of invention or improvement must prove before the Department of Promotion at the end of each five years of the life of a patent, in order to preserve it for another like period; that he has made to the General Treasury of the Federation, at the end of the first five years, a payment of fifty *pesos*; at the end of ten years a payment of seventy-five *pesos*, and at the expiration of fifteen years a payment of one hundred *pesos*. All these payments must be made in Mexican *pesos*.

The term within which these payments must be proven will be two months next succeeding the expiration of the five-year period, and it is not extendible.

ART. 34. The Department of Promotion shall make an entry in the registry of letters patent of the fact that the requirements of the foregoing articles have been complied with.

ART. 35. Letters patent are null and void—

I. Whenever they may have been issued in contravention of the provisions of articles 2, 3, and 4. Nevertheless, when letters patent shall have been obtained, in conformity with a petition wherein the applicant has presented and obtained more than what he is entitled to as the first discoverer or inventor, his letters patent shall be valid in so far as they conform to whatever he may be entitled to, provided they do not infringe the provisions of the following subdivision and that no fraud shall have been committed upon making the petition. In this case the letters patent shall be limited only to what they should cover, the proceedings incident thereto to be in conformity with the provisions of article 39.

II. Whenever the object for which the patent has been sought is different from that which is granted by virtue of the letters patent.

III. Whenever it is proved that the main object sought in the petition for the letters patent is comprised within one of the cases referred to in Subdivision II of article 21.

The proceedings to invalidate letters patent have to be commenced within the term of one year after the date when the patent shall be put in operation in the Republic.

ART. 36. An action for the purpose of declaring invalid letters patent before the courts may be instituted in the name or on behalf of the district attorney.

Whoever may work or have in operation the same industry shall have the right to interpose an exception and take part in the proceedings of interference.

ART. 37. Letters patent shall lapse—

I. Whenever the term for which they were granted shall have terminated and they may not have been extended.

II. When they shall be given up in part or in their entirety.

III. Through failure to comply with the provisions of article 33.¹

ART. 38. The Department of Promotion shall declare the invalidity of the patent in the first two cases referred to in the foregoing article; in the third case it can only be done by the court at the instance and request of the district attorney or of the party in interest by instituting interference proceedings to that end.

ART. 39. The decrees of nullity and lapse of letters patent shall be published in the official journal of the Federal Government and entered in the records of the Department of Promotion.

ART. 40. The decrees of nullity and lapse of letters patent have the effect of affording the public in general the use of inventions or improvements.

In case of relinquishment of letters patent, should only a portion of the same be relinquished the public has merely the right to use the portion thus abandoned, the letters patent remaining valid as to the rest thereof. The relinquishment shall be made in writing and be entered in the record.

ART. 41. The ownership of letters patent may be assigned by any of the means established by law with regard to private property, but no act of assignment or any other that implies the modification of the right of property shall be prejudicial to the rights of third parties, if the same shall not be recorded in the office of the Department of Promotion.

ART. 42. Everything relating to the fraudulent infringement of letters patent shall be subject to the provisions of the penal code of the Federal District and of the codes of procedure.

ART. 43. The proceedings relating to letters patent at present pending shall be continued and decided in conformity with the provisions of this law in all things unacted on.

ART. 44. All those at present enjoying privileges by virtue of letters patent now in full force may avail themselves of the provisions of this law upon paying beforehand the fees herein set forth.

ART. 45. The Executive of the Union may issue rules of practice appropriate to this law, and may establish, if he deems it proper, a patent office in connection with the Department of Promotion.

¹The Mexican Congress, on June 2, 1896, by legal enactment provided that parties whose patents had lapsed through failure to comply with the provisions of article 33, as originally framed in the law of June 7, 1890, might take advantage of the terms of the amendment to escape the penalty of lapse, provided they proved the payment of the sums therein mentioned within the three months next succeeding its promulgation, and provided further that there is no prejudice to the rights which third parties might have acquired since the application of the penalty of lapse.

ART. 46. The law of May 7, 1832, and every part thereof, and all other provisions of law adopted relative to this subject, are hereby repealed.

The Mexican law relating to trade-marks was promulgated by the President on the 28th of November, 1889, and went into effect on the 1st of January, 1890.

Following is a translation thereof, with amendments promulgated December 17, 1897:

ARTICLE 1. A mark specially distinguishing in trade any product of industry shall be considered a trade-mark.

ART. 2. The protection conceded by this law to trade-marks does not cover any article not manufactured or sold in the country.

ART. 3. No form, color, motto, or title which does not in itself constitute a specially distinguishing mark in trade of a product is registrable as a trade-mark. In no case shall such mark be *contra bonos mores*.

ART. 4. Any proprietor of a trade-mark, whether a citizen or a foreigner residing in the country or abroad, may acquire the exclusive right to the use of the same in the Republic, subject to the provisions of this law.

Citizens and foreigners residing abroad having an industrial or mercantile establishment for the sale of their products in this country may register ownership of trade-marks, subject, however, in the case of foreigners, to treaty provisions.

ART. 5. In order to acquire exclusive ownership of a trade-mark the party in interest must make application in person or by a representative to the Department of Promotion, declaring that he reserves his rights, accompanied by the following documents:

I. A power of attorney in case the party in interest does not appear in person.

II. Two copies of the trade-mark or an engraved or photographic reproduction thereof.

III. In case the trade-mark on an article is in intaglio or in relief, or has some other peculiarity, two separate sheets will also be forwarded on which these particulars will appear, either by means of one or more detail drawings or a written description.

ART. 6. The application should set forth the name of the manufactory, its location, the residence of the proprietor, and the kind of trade or industry in which the applicant desires to use the trade-mark.

ART. 7. A trade-mark owned by a foreigner not residing in the Republic can not be registered therein unless previously and regularly registered in the country where originated.

ART. 8. Only such persons as shall have made legal use of a trade-mark may acquire ownership thereof. In case of a contest between two owners of the same mark, the ownership will vest in the original

possessor, or, in case possession can not be proven, in the first applicant.

ART. 9. The exclusive ownership of a trade-mark can not be exercised except by virtue of a certificate of the Department of Promotion to the effect that the party in interest has reserved his rights after having complied with all legal requisites.

ART. 10. The certificate referred to in the preceding article will be issued without previous examination, on the exclusive responsibility of the applicants, and without prejudice to the rights of third parties.

The Department of Promotion will cause the application to be published, and in case of contest, filed within ninety days succeeding date of publication, the mark will not be registered until the courts shall decide which party is entitled to registration.

ART. 11. Trade-marks can only be transferred with the business for whose manufactures or trade they serve as a distinctive device; the transfer, however, is not subject to any special formality and will be carried into effect according to the provisions of law.

ART. 12. The duration of the ownership of trade-marks is indefinite, but the right will be considered as abandoned by the closing or failure to produce for more than a year of the establishment, manufactory, or business employing the same.

ART. 13. Trade-marks deposited shall be preserved in the Department of Promotion, where the registration may be examined, during the hours set apart for the purpose by the said Department, by any person so desiring, and who, at his own expense, may procure a certified copy of the registration.

ART. 14. The property in a trade-mark obtained in violation of the foregoing provisions shall be judicially declared void on application of interested parties.

ART. 15. The judge hearing the case in which the property in a trade-mark shall be declared void shall give notice of the final judgment therein to the Department of Promotion.

ART. 16. Trade-marks are counterfeited—

I. When trade-marks are used which are facsimiles of a registered trade-mark.

II. When the imitation is so exact a reproduction of a registered trade-mark, although it may differ in certain details, that it may be taken for the same.

ART. 17. All such as shall have counterfeited or made use of a counterfeit trade-mark, provided it be in connection with articles of the same industrial or commercial character, shall be guilty of the crime of counterfeiting, wherever the same may have been committed.

ART. 18. Crimes of counterfeiting trade-marks shall be subject to the penalties prescribed by the code applicable to the case, and shall be liable further to an action for damages.

ART. 19. The provisions of this law shall also cover industrial drawings and models.

The fee charged for the trade-mark is 10 *pesos*.

Under the provisions of this law the number of applications for trade-mark registration from 1890 to 1897 was:

1890.....	97	1894.....	79
1891.....	112	1895.....	91
1892.....	161	1896.....	101
1893.....	108	1897.....	207

or a total of 956, according to official figures.

CHAPTER XVIII.

COST OF LIVING—WAGES TO LABOR—BUILDING, ETC.

It may be said in a general way that the cost of living in México is not great, although, of course, it varies in different localities. In the interior towns and villages the common necessities of life, such as beef, vegetables, etc., are cheap. Coffee and tea, the latter being very seldom used or seen in the interior, are expensive. Imported goods are also expensive, as to their cost in gold must be added the import duties and the merchants' profits. The native food is rich and highly seasoned. Meals may be had at the hotels in the interior for about 50 cents each; board and lodging at these hotels range from \$2 to \$2.50 per day.

In the City of México living is more expensive. Hotels charge from \$2.50 to \$10, silver, per day. Good meals may be procured at any first-class restaurant for \$1.

Ready-made clothing, such as is to be found in the United States, is not much in vogue; but imported English and French cloth is made up into suits at about the same cost as in the United States. The large dry-goods establishments, millinery stores, etc., are as well stocked as those of the larger cities of the United States, and for imported goods the prices vary very little from those prevailing in the latter country.

Rents in the City of México, however, are very high. This is due to the cost of house building, the municipal tax of 12 per cent on the annual rental, pavement, drainage, water, and stamp taxes. The expense in taxes on a house costing \$10,000 to build, and renting for \$75 per month, is \$13.08 per month, or about 17½ per cent of the receipts.

There is not much money to be saved by hiring private lodgings unless it is proposed to take them for a protracted period. Furnished rooms in desirable localities cost nearly as much as hotel apartments. Although unfurnished rooms may be secured, the cost for furnishing them is very considerable; still they rent for about one-half the amount charged for furnished rooms. *Casas de huéspedes*, corresponding to the American boarding house, abound; but as a rule the meals served are not of the best. Their charges are relatively moderate. The hotels, generally, in the smaller cities and towns, are not provided with baths, but in the City of México, as everywhere else, there are excellent public baths. The prices at these establishments are, usually,

for cold baths, 1 real (12½ cents); for warm baths, 2 reales (25 cents).¹ Street tramways in the City of México generally charge 6¼ cents. Hackney coaches are divided into four classes, distinguished by tin flags painted in different colors, indicating the charge per hour for each, as follows: White flag, 50 cents per hour; red flag, \$1 per hour; blue flag, \$1.50 per hour. Good livery stables abound and saddle horses may be secured at the rate of \$3 for a morning's ride, or \$4 for an entire afternoon. A tourist intending to take a short trip to México would do well to calculate his expenses at \$10 per day, including traveling expenses.

Labor is abundant in México; in some places the supply is greater than the demand, and as the laboring classes can live on such frugal diet and need so little clothing, wages, except for imported skilled labor, are small.

The *hacendados*, as the large landowners are called, own immense tracts of land, and the *hacienda*, or manor, is a congregation of buildings, forming at times quite a settlement. The *hacendado* usually works his possessions in accordance with the traditions handed down from the time of the Spanish conquest, and he is not only a landowner, but he is a dealer in provisions, clothing, etc. His "peones," as the laborers and the tillers of his soil are called, are generally descended from those his father had before him, and they are paid, live, and work as their progenitors, and receive generally from 20 to 37½ cents a day.

With respect to the rates of wages paid in the Republic, the United States Minister to México, under date of September 26, 1896,² reported to the Department of State that the amount of wages paid varies throughout the Republic, being higher in some sections than in others, and in certain mining districts lower than they were ten to fifteen years ago. This is generally owing to local causes. As a matter of course, owing to the construction and management of 7,000 miles of railroads, the introduction of electricity, and the placing of new and improved machinery in many of the mines and in some of the agricultural districts, there has been an increase in the number of skilled laborers, and some increase in the demand for the same, but it is true that with the great mass of the Mexican laborers there has been but little, if any, change in the amount of wages paid.

As might naturally be expected, there are some instances where laborers receive more than they did ten years ago, but these are the exceptions. There are also many instances where less is received. The daily wage paid to the farm laborer hired by the day does not exceed 30 cents, taking into account the whole laboring agricultural

¹ Mexican currency.

² United States Consular Reports, special report, "Money and Prices in Foreign Countries," Vol. XII, Part I, p. 16.

population. There are instances where the day laborer receives 50 cents per day; but again there are also instances where he only receives 15 to 20 cents. The Secretary of the Treasury of México estimates the daily wage of farm laborers at 25 cents.

To obtain a correct idea of the daily wages paid to the agricultural laborer it is well to divide the Republic into three districts:

First. The tropical or hot country, where labor is scarcer than on the table-lands and there is not the same necessity to work. Here, on the coffee plantations, the laborers receive from 37 to 50 cents per day.

Second. The central plateau, or table-lands, which constitute the greater portion of México as regards wealth, population, etc. Here the wages vary from $12\frac{1}{2}$ to 50 cents per day, the average being from 18 to 35 cents.

Third. The northern portion. Here labor is scarce, the influence of American customs is felt to some extent, and wages are higher than in the central portion.

A large portion of the farming in México is carried on under the "share system." The Government reports show that in many instances rations of corn are furnished to the hired laborer. In some cases we find that he is allowed a small amount per day for his board, in addition to wages; again, he is furnished by the landlord with a small piece of land to cultivate for his own benefit.

The wages of unskilled laborers in the fields, on the farms, in shops, and all other places where such labor is employed are from 25 to 30 cents a day for men, and for women and boys from a third to a half less, the only rations ever furnished being corn and beans.

In the mines the wages of the same class of labor are from 40 to 60 and to 80 cents a day and no rations.

In the factories the wages of this same class are from 18 to 25 and 37 to 62 cents a day, without rations.

The wages of a higher class of operatives in the factories vary from 45 to 75 cents per day and no rations.

A day's labor in México is from nine to thirteen hours.

The prevailing style of architecture throughout México, so far as regards what may be termed modern buildings as contradistinguished from the ruined temples and palaces of the Republic, is the Spanish renaissance. The cathedrals and churches are all built in this style. Arabesque work and stone carvings ornament the façades of nearly all religious edifices. Governmental buildings and those devoted to public uses are generally imposing and commodious. The National Palace in México has a frontage of 675 feet and is two stories high.

Private houses are always substantially built, generally in a rectangular form around a courtyard. It is rare, except at the capital, to see a private residence over two stories high. The roofs are flat,

with a wall running entirely around them. The roof is called the *azotea*, and in the warmer region is often utilized by the residents for sleeping purposes during the dry season. Growing plants and shrubs are often to be seen on the *azotea* and in the courtyard. The windows of the houses are generally barred with railings of iron. The larger residences are constructed of igneous rock, such as porous amygdaloid, porphyry, or trachyte. Dwellings are made usually of brick and *tepetate* (a kind of clay thickly sprinkled with sand and pebbles, which is soft when taken out of the deposit, but on exposure becomes exceedingly hard) and are stuccoed.

Some very fine examples of modern architecture may now be seen along the *Paseo de la Reforma* in the capital, where the wealthy class have erected several imposing residences with every comfort incident to those of more northern climes.

On the table-lands houses in the smaller towns and villages are constructed of adobe, a sun-dried brick made of dark clay mixed with straw.

The peons in the warm, well-wooded regions build of wood, palm leaves, and stalks; in the table-lands, of adobe, the houses having flat roofs of stamped clay supported by beams.

In the Indian villages the rudest possible habitations are to be seen, often being mere frameworks of limbs of trees, with the bark on, and thatched in on all sides with grass, palm leaves, or stalks. This, of course, does not apply to the City of México, which is to-day a modern city of the first class.

CHAPTER XIX.

MISCELLANEOUS DATA.

Area of the States and Territories of México.

CENTRAL STATES.		GULF STATES.	
	Myriares, <i>a</i>		Myriares, <i>a</i>
Federal District	1, 200	Campeche	46, 855
Aguascalientes	7, 644	Tabasco	26, 094
Durango	98, 470	Tamaulipas	84, 394
Guanajuato	29, 458	Veracruz	75, 651
Hidalgo	23, 101	Yucatán	91, 201
México	23, 957		
Morelos	7, 184	STATES OF THE PACIFIC COAST.	
Puebla	31, 616	Baja California (Territory)...	151, 109
Querétaro	9, 215	Colima	5, 887
San Luis Potosí	65, 586	Chiapas	70, 524
Tlaxcala	4, 132	Guerrero	64, 756
Zacatecas	64, 138	Jalisco	82, 503
		Michoacán	59, 261
NORTHERN STATES.		Oaxaca	91, 664
Chihuahua	227, 468	Sinaloa	87, 231
Coahuila	161, 550	Tepic (Territory)	29, 211
Nuevo Leon	62, 998		
Sonora	199, 224	Total	1, 983, 282

Area of the islands.

Guadalupe (Pacific Ocean) ...	208	Montserrat (Pacific Ocean) ..	18
Cedros (Pacific Ocean)	343	Cármen (Pacific Ocean)	134
Santa Margarita (Pacific Ocean)	171	San Márcos	24
Creciente (Pacific Ocean)	32	Partida (Pacific Ocean)	1
Revillagigedo (Pacific Ocean) ..	186	Cozumel (Caribbean Sea)	406
Tres Marías (Pacific Ocean) ..	232	Mujeres (Canal of Yucatán) .	4
Tiburón (Gulf of California) .	963	Espíritu Santo (Gulf of California)	96
Angel de la Guarda (Pacific Ocean)	636	Other small islands	82
Montague (Pacific Ocean)	47	Total	4, 042
San Estéban (Pacific Ocean) .	41		
San Lorenzo (Pacific Ocean) .	49	Total area of the States and Territories	1, 983, 282
San José (Pacific Ocean)	190	Total area of the islands	4, 042
Cerralvo (Pacific Ocean)	113		
Santa Catalina (Pacific Ocean) ..	66	Grand total	1, 987, 234

a One myriare is equal to 1,000,000 square meters, or 1,196,000 square yards, or 247,105 acres.

Position and altitude of the capitals of the States.

State.	Capital.	Latitude.		Longitude.		Authority.	Altitude.	Authority.
Durango.....	Durango.....	24	01	28.7	0	31	55.1 W.	L. Fernández.
Zacatecas.....	Zacatecas.....	22	46	34.6	3	26	21.6 W.	do.
San Luis Potosí.....	San Luis Potosí (cross on top of the tower of the cathedral).	22	09	07.7	1	50	30.5 W.	Comisión Geográfico-Exploradora.
Aguas Calientes.....	Aguascalientes.....	21	53	01.0	3	09	56.4 W.	A. Anguiano.
Guanajuato.....	Guanajuato.....	21	00	57.7	2	07	07.8 W.	do.
Querétaro.....	Querétaro.....	20	35	41.6	1	15	20.0 W.	do.
Hidalgo.....	Pachuca.....	20	07	35.0	0	23	19.2 E.	Landero y L. Fernández.
México.....	Toluca.....	19	17	27.7	0	32	47.4 W.	Jiménez y A. Díaz.
Distrito Federal.....	México.....	19	26	05.0	0	53	45.0 E.	do.
Tlaxcala.....	Tlaxcala.....	19	19	04.0	0	06	42.0 W.	Comisión Geográfico-Exploradora.
Morelos.....	Guernavaca.....	18	55	02.3	0	56	06.0 E.	F. Jiménez.
Puebla.....	Puebla.....	19	02	30.5	0	56	06.0 E.	Comisión Geográfico-Exploradora.
Sonora.....	Hermosillo (cross on tower of the cathedral).	29	04	28.0	11	49	48.8 W.	do.
Chihuahua.....	Chihuahua.....	28	38	23.2	6	56	22.8 W.	F. Valle y L. Fernández.
Coahuila.....	Saltillo.....	25	25	26.0	1	48	24.0 W.	F. Valle y F. Landero.
Nuevo León.....	Monterrey.....	25	40	14.9	1	10	07.0 W.	Landero.
Tamaulipas.....	Ciudad Victoria.....	23	42	54.0	0	01	02.0 E.	Causeiro y L. Fernández.
Veracruz.....	Xalapa.....	19	31	33.0	2	13	12.5 E.	Comisión Geográfico-Exploradora.
Tabasco.....	S. Juan Bautista.....	17	59	15.0	6	12	47.8 E.	Guatemala Boundary Commission.
Campeche.....	Campeche (approximate).	19	49	50.0	8	33	30.0 E.	(a)
Yucatán.....	Mérida (approximate).	20	55	40.0	9	24	30.0 E.	(b)
Baja California (Territory).	La Paz.....	24	10	10.0	11	13	56.0 W.	American Chart Narragansett.
Sinaloa.....	Culiacán.....	24	48	08.6	8	18	30.8 W.	F. Quijano (deducted).
Tepic Territory.....	Tepic.....	21	30	47.2	5	46	14.7 W.	Landero.
Jalisco.....	Guadalajara.....	20	40	45.5	4	12	31.4 W.	A. Anguiano.
Colima.....	Colima.....	19	14	21.0	4	35	47.0 W.	Landero.
Michoacán.....	Morelia.....	19	42	13.1	2	03	29.3 W.	L. Fernández.
Guerrero.....	Chilpancingo.....	17	33	10.0	0	22	02.7 W.	Jacobo Blanco.
Oaxaca.....	Oaxaca.....	17	03	28.0	2	25	20.7 E.	Pastrana.
Chiapas.....	Tuxtla Gutiérrez.....	16	45	20.0	6	00	50.0 E.	Guatemala Boundary Commission.

a 27.20 meters, cemetery; 14.20 meters, shore.

b Near the sea level.

Altitude of some mounts, valleys, and notable railway stations.

State.	Name.	Class.	Altitude.	Authority.
			<i>Meters.</i>	
Veracruz	Pico de Orizaba (Citlat-tepec).	Volcano	5,700	Comisión Geográfica Exploradora.
México and Puebla	Popocatepetl	do	5,452	Do.
México	Ixtacihuatl (highest point).	do	5,286	Do.
Do.	Ixtacihuatl (top rock).	do	5,146	Do.
Do.	Ixtacihuatl (foot rock).	do	4,740	Do.
Puebla and Tlaxcala.	Malinche	do	4,461	Do.
México	Nevado de Toluca	do	4,623	Humboldt.
Veracruz	Cofre de Perote (Nauhcampantepetl).	do	4,281	Comisión Geográfica Exploradora.
Federal District	Ajusco	Mount	3,986	Do.
Jalisco	Volcán de Colima	Volcano	3,960.09	Matute y Bárcena.
Puebla	Las Derrumbadas	Mount	3,598.09	Almazán.
Do.	Ocelotzín	do	3,500.06	Do.
Oaxaca	Cempoaltepec (summit)	do	3,396	Harcort.
México	Sumate	do	3,352.07	Report of Pedro G. Conde.
Puebla	Pinal	do	3,316	Comisión Geográfica Exploradora.
Hidalgo	Jacal ó Navajas (near Real del Monte).	do	3,137.05	Burkart.
Puebla	Chichintepéc	do	3,072	Almazán.
México	Tarimangacho (near Talpujahua).	do	3,068.01	Burkart.
Oaxaca	Cumbre de los Ocotes.	do	3,056	Harcort.
Tepic	Ceboruco	Volcano	2,161	Matute, Iglesias y Bárcena.
Zacatecas.	Buía	Mount	1,383	Bustamante.
Michoacán	Jorullo	Volcano	1,300	Humboldt.
Tlaxcala	Llanos de Apam	Plain	2,480	Data collected by Sr. Ferrari.
Puebla	San Juan de los Llanos	do	2,360	Do.
Hidalgo	Llanos del Cazadero	do	2,300	Do.
San Luis Potosí	Llanos de "El Salado"	do	2,000-2,300	Do.
Michoacán	Pátzcuaro	Valley	2,000-2,150	Do.
Hidalgo	Tula	do	2,047	Do.
Guanajuato	El Bajío	do	1,750-1,790	Do.
Durango	Cuencamé	do	1,740	Do.
Veracruz	Valle de Maltrata	do	1,691	Do.
Do.	Valle de Orizaba	do	1,227	Do.
San Luis Potosí	Valle del Maíz	do	1,220	Do.
Tamaulipas	Tula	do	1,171	Do.
Durango	Vegas de Nazas	do	1,100	Do.
Guerrero	Iguala	do	919	Do.
Michoacán	Jorullo	do	850	Do.
Jalisco	Acaponeta	do	61	Do.
Federal District	La Cima	Railway station on the Cuernavaca and Acapulco R. R.	3,040	Data from the Ministerio de Comunicaciones.
México	Salazar	Railway station on the Compañía Nacional Mexicana.	3,000	Do.
Veracruz	Las Vigas	Railway station on the Veracruz and Jalapa.	2,421.10	Do.
Do.	Boca del Monte	Railway station on the Nacional Mexicano.	2,415.36	Do.
Puebla	Amozoc	Railroad station	2,320	Do.

General synopsis of the meteorological observations taken in several places of the Republic during the year 1897.

Places.	Barometer reduced to 0.			Temperature in the shade. ^a			Mean annual humidity per centage.
	Mean annual.	Maximum absolute.	Minimum absolute.	Mean annual.	Maximum absolute.	Minimum absolute.	
	<i>Mm.</i>	<i>Mm.</i>	<i>Mm.</i>	°	°	°	
Colima (seminary)	718.3			24.7	36.7	8.3	68
Guadalajara (hospital)	633.1	639.3	630.1	20.2	34.1	2.2	68
Guadalajara (Government palace)	634.7	641	628.6	19.9	35	0.4	87
Guanajuato	601.7	607.8	596	18.2	32.9	3.1	49
Jalapa	648.7	656.9	641.8	18	35	5	82
Leon	617.3	624	612.1	18.6	32.9	- 2.4	50
Linares (Nuevo Leon)				22.1	38.8	- 4.5	
Magdalena (Sonora)				21.4			
Mazatlán	759.9	766	755.2	25.4	35.3	12.7	75
Mérida	760.3	770.2	753.8	26.2	39	12	72
México (Central Observatory)	586.2	591.9	580.6	16.3	29.8	2	57
Monterey	716.2	727.6	705.7	22.3	40	2.9	65
Morelia (seminary)	609.2	614.1	603.5	17.7	31	3	63
Oaxaca	637	643.3	633.3	20.9	35	4.1	64
Pachuca	573.4	578	570	14.6	30.4	- 0.8	57
Puebla (Catholic college)	593.8	598.3	589.7	18.2	30	- 0.7	55
Puebla (State college)	593.2	597.9	588.8	16.7	27.7	1.7	61
Querétaro	614.7	620.5	609.3	18.3	32.8	- 0.3	53
Real del Monte	549.2			12.4			
San Luis Potosí	613.5	620	606.6	17.8	30.6	1.7	61
Saltillo (San Juan College)	630.7	638.6	624.4	18.5	36.1	- 0.6	58
Silao	616.7	623.9	611.7	19.8	30.8	3.9	59
Toluca	557.2	561.9	552.4	14.3	27.8	- 3.2	62
Trejo (plantation)							
Zacatecas	572.4	577.5	566.7	15.8	29	- 1.2	54

Places.	Rainy days.	Total rainfall.	Rainfall.			
			Largest monthly rainfall.		Maximum altitude in 24 hours.	
			Month.	Amount.	Date.	Amount.
		<i>Mm.</i>		<i>Mm.</i>		<i>Mm.</i>
Colima (seminary)	127	900.3	June	241.7	June 12	49.7
Guadalajara (hospital)	77	1877.3	Do	620.3	July 2	160
Guadalajara (Government palace)	78	1076	August	395.3	Aug. 25	91.5
Guanajuato	126	740.2	July	241.4	Aug. 8	47
Jalapa	174	1193.3	June	298.4	June 18	47
Leon	118	571.6	July	210.8	July 4	36.2
Linares (Nuevo Leon)	93	858.1	May	296	May 5	104
Magdalena (Sonora)	50	636.8	August	202	Sept. 19	79
Mazatlán	67	695.3	Do	266.5	Aug. 19	81.8
Mérida	115	875	Do	267.1	Aug. 29	53.2
México (Central Observatory)	139	652.1	Do	153.9	Sept. 5	48.7
Monterey	90	561.1	Do	146.4	Nov. 22	72.4
Morelia (seminary)	145	580.3	September ..	145.6	Sept. 12	27.2
Oaxaca	121	843.9	June	252.2	June 11	102.8
Pachuca	66					
Puebla (Catholic college)	103	908.4	August	258.8	Sept. 11	61
Puebla (State college)	137	828	July	201.6	Sept. 5	44.3
Querétaro	93	518.6	August	136.5	June 3	38.5
Real del Monte	112	779.9	Do	169.2	Oct. 4	38.9
San Luis Potosí	67	367.8	June	118.4	June 4	45.2
Saltillo (San Juan College)	72	343	August	103	May 31	26
Silao	102	577.7	Do	185.1	Aug. 31	50.2
Toluca	123	549.6	July	156.9	June 23	36.2
Trejo (plantation)	69	803.7	August	280.6	Aug. 28	77
Zacatecas	69	784.9	July	223.9	June 26	53.2

^a Centigrade.

General synopsis of the meteorological observations taken in several places of the Republic during the year 1897—Continued.

Places.	Clouds.		Wind.		Evaporation.	
	Mean annual quantity.	Predominant direction.	Mean velocity per second.	Predominant direction.	Maximum velocity per second.	In the shade. Open air.
Colima (seminary)	4.6	SW.	M. 1.5	SW.	M. 4.2	Mm. 4.2
Guadalajara (hospital)	3.1			SW.	10.7	4.8 9.2
Guadalajara (Government palace)	5.5	WSW.				4.7 7.1
Guanajuato	5	SW.	1.5	ENE.	18.1	3.6 6.9
Jalapa	6.1			NNW.	9	2.9
Leon	5.6	E.	1.1	SSW.	17	3.3 8.4
Linares (Nuevo Leon)				SSE.		
Magdalena (Sonora)	5.5	N.		SW.		
Mazatlán	3.5	SW.	3.2	NW.	19	2.5 7
Mérida	4.5	E., W	1.9	NE.	6.8	1.9 7.4
México (Central Observatory)	5.3	NE.	1.1	NW.	15	2.6 6.2
Monterey	4.8	NE.	.6	NE.	7.5	7.8
Morelia (seminary)	5.9	W.	1.4	SSW.	6.7	7.1
Oaxaca	4.5	NE.	1.5	NW.	12.5	5.3
Pachuca	4.5			NNE.		
Puebla (Catholic college)	3.5		.9	E.	15	
Puebla (State college)	4.9	ENE.	1.6	NE.	20.8	6.3
Querétaro	4.5		1.2	E.	10	2.9 9
Real del Monte	4.6		.7	N., S.	3.7	5.2
San Luis Potosí	4.1	W.	.8	E.	17	
Saltillo (San Juan College)	3.9	N.	1.3	N. SW.	9.7	3.9
Silao	4.1	SW.		W.	12	
Toluca	4.7		3.1	ENE.	20	1.8
Trejo (plantation)						
Zacatecas	5.3	E.	.6	E.	18	3.2 5.6

Births, deaths, and marriages during the year 1896, and population in 1895.

States.	Births.				
	Male.	Female.	Total.	Legitimate.	Illegitimate.
Aguascalientes	723	633	1,356	1,242	114
Campeche	1,671	1,734	3,405	2,503	902
Coahuila	3,487	3,198	6,685	6,161	524
Colima	958	996	1,954	1,246	708
Chiapas	5,247	5,057	10,304	2,800	7,504
Chihuahua	5,604	5,188	10,792	8,922	1,870
Distrito Federal	2,403	1,873	4,276	2,389	1,887
Durango	3,482	3,200	6,682	4,740	1,942
Guanajuato	14,543	13,584	28,127	12,615	15,512
Guerrero	9,489	8,795	18,284	14,188	4,096
Hidalgo	17,306	15,906	33,212	10,146	23,066
Jalisco	24,990	23,617	48,607	42,392	6,215
México	10,755	9,813	20,568	16,442	4,126
Michoacán	12,007	11,200	23,207	5,215	17,992
Morelos	2,688	2,613	5,301	3,143	2,158
Nuevo Leon	6,217	5,781	11,998	11,032	966
Oaxaca	17,835	16,543	34,378	12,720	21,658
Puebla	12,241	11,407	23,648	13,736	9,912
Querétaro	2,054	1,771	3,825	2,989	836
San Luis Potosí	7,111	6,949	14,060	11,507	2,553
Sinaloa	4,508	4,097	8,605		
Sonora	2,269	2,001	4,270	2,964	1,306
Tabasco	3,199	2,934	6,133	3,146	2,987
Tamaulipas	2,148	1,903	4,051	3,077	974
Tlaxcala	2,966	3,133	6,099	5,157	942
Veracruz	14,200	12,798	26,998	10,248	16,750
Yucatán	7,538	7,617	15,155	12,424	3,031
Zacatecas	10,483	9,821	20,304	17,030	3,274
Baja California	364	275	639	352	287
Tepic	1,945	1,817	3,762	2,247	1,515
Total	210,731	196,254	406,985	242,773	155,607

Births, deaths, and marriages during the year 1896, and population in 1895—Continued.

States.	Deaths.					Marriages.			Population, census 1895
	Mexicans.	Foreign.	Male.	Female.	Total.	Single.	Widowed.	Mexicans.	
Aguascalientes	4,190	3	2,215	1,978	4,193	797	113	906	104,615
Campeche	1,994	22	969	1,047	2,016	1,202	110	1,306	88,302
Coahuila	6,508	35	3,329	3,214	6,543	4,007	233	4,209	241,026
Colima	2,226	.....	1,208	1,018	2,226	350	44	390	55,752
Chiapas	6,321	88	3,364	3,045	6,409	2,223	1	2,212	319,599
Chihuahua	6,192	48	3,074	3,166	6,240	3,462	146	3,575	262,771
Distrito Federal	23,274	221	12,208	11,287	23,495	2,214	82	2,164	476,413
Durango	6,481	19	3,322	3,178	6,500	2,565	133	2,678	286,906
Guanajuato	36,047	12	18,579	17,480	36,059	3,957	331	4,276	1,062,554
Guerrero	13,325	2	6,881	6,446	13,327	7,157	637	7,793	417,621
Hidalgo	21,521	24	11,520	10,025	21,545	2,465	67	2,531	558,769
Jalisco	32,729	12	17,007	15,734	32,741	16,563	2,133	18,685	1,107,227
México	32,077	13	16,434	15,656	32,090	5,775	513	6,274	841,618
Michoacán	26,395	21	13,686	12,730	26,416	3,170	218	3,384	894,753
Morelos	8,326	6	4,248	4,081	8,332	1,138	66	1,203	159,355
Nuevo Leon	8,765	34	4,413	4,384	8,797	4,148	350	4,480	309,252
Oaxaca	26,995	26	14,276	12,745	27,021	3,220	132	3,338	884,909
Puebla	33,836	24	17,464	16,396	33,860	4,453	305	4,738	984,413
Querétaro	6,909	3	3,605	3,306	6,911	1,019	37	1,054	228,551
San Luis Potosí	18,466	77	9,688	8,855	18,543	4,179	283	4,449	568,449
Sinaloa	.....	.....	2,702	2,345	5,047	.....	.....	.....	258,865
Sonora	3,260	35	1,733	1,562	3,295	1,426	102	1,510	191,281
Tabasco	3,220	20	1,642	1,598	3,240	1,232	48	1,283	134,839
Tamaulipas	4,566	74	2,447	2,193	4,640	2,166	128	2,277	206,502
Tlaxcala	5,613	.....	2,841	2,772	5,613	1,781	137	1,918	166,803
Veracruz	25,736	175	13,770	12,141	25,911	4,751	157	4,819	866,355
Yucatán	12,834	75	6,422	6,487	12,909	4,712	524	5,215	298,850
Zacatecas	15,416	15	7,868	7,563	15,431	5,160	514	5,668	452,578
Baja California	585	17	331	271	602	366	18	361	42,245
Tepec	4,699	3	2,486	2,216	4,702	995	59	1,050	158,776
Total	398,503	1,104	209,732	194,922	404,654	96,653	7,621	103,726	12,619,949

Estimated value of the city and suburban property in México on December 31, 1897.

[Values in Mexican silver.]

States.	City.	Suburban.	Total.
Aguascalientes	\$1,713,936.71	\$3,121,959.57	\$4,835,896.28
Campeche	3,920,927.10	3,587,668.64	7,508,595.74
Coahuila	4,640,586.00	2,727,695.00	12,368,281.00
Colima	1,388,394.00	2,419,620.00	3,808,014.00
Chiapas	3,163,465.50	21,839,645.18	25,003,110.68
Chihuahua	2,711,378.30	5,281,962.72	7,993,341.02
Durango	3,966,943.00	8,739,062.00	12,706,005.00
Guanajuato	11,368,749.00	32,794,405.00	44,163,154.00
Guerrero	1,120,704.00	2,068,103.00	3,188,807.00
Hidalgo	1,969,793.94	17,480,106.48	19,449,900.42
Jalisco	20,777,103.00	31,297,872.00	52,074,975.00
México	8,256,352.51	26,751,381.83	35,007,734.34
Michoacán	9,170,426.00	22,477,627.00	31,648,053.00
Morelos	1,505,829.96	7,577,964.92	9,083,794.88
Nuevo Leon	5,870,605.27	6,779,165.51	12,649,770.78
Oaxaca	7,307,945.91	8,165,092.11	15,473,038.02
Puebla	20,233,410.07	29,548,992.63	49,782,402.70
Querétaro	4,106,347.00	9,380,933.00	13,487,280.00
San Luis Potosí	7,604,934.02	11,599,513.23	19,204,447.25
Sinaloa	5,124,259.00	4,003,295.00	9,127,554.00
Sonora	2,628,832.30	4,175,345.35	6,804,177.65
Tabasco	4,346,111.00	4,572,455.84	8,918,566.84
Tamaulipas	5,578,890.68	4,465,462.14	10,044,352.82
Tlaxcala	845,582.00	6,790,857.00	7,636,439.00
Veracruz	19,784,825.68	23,609,849.28	43,394,674.96
Yucatán	11,766,078.52	10,147,238.31	21,913,316.83
Zacatecas	8,173,748.23	15,016,178.33	23,189,926.56
Territory of Tepec	2,626,257.00	2,659,785.00	5,286,042.00
Baja California:			
Distrito "Sur"	938,467.17	3,609,527.90	4,547,995.07
Distrito "Norte"	193,602.20	1,416,437.18	1,610,039.38
Distrito Federal	115,449,807.37	22,963,470.22	138,413,277.59
Total	298,254,292.44	362,068,671.37	660,322,963.81

Total revenues and expenditures of the States of México from 1888 to 1897.

[Values in Mexican silver.]

States.	Total revenues.	Total expenditures.
Aguascalientes.....	\$1,130,345.65	\$1,119,522.11
Campeche.....	2,345,320.67	2,258,715.30
Coahuila.....	3,290,743.16	2,888,696.25
Colima.....	1,417,386.52	1,399,714.25
Chiapas.....	3,127,592.66	2,879,662.86
Chihuahua.....	3,268,143.59	1,865,339.02
Durango.....	5,676,673.93	5,610,073.97
Guanajuato.....	11,869,737.09	11,556,992.09
Guerrero.....	3,814,527.55	2,553,917.62
Hidalgo.....	14,403,192.91	14,102,409.83
Jalisco.....	12,904,430.05	13,068,721.75
México.....	8,612,211.66	8,319,536.71
Michoacán.....	9,563,909.71	9,441,716.58
Morelos.....	3,445,649.14	3,410,995.65
Nuevo Leon.....	1,821,905.61	1,625,426.89
Oaxaca.....	6,532,831.72	6,097,778.28
Puebla.....	11,015,179.31	10,834,076.32
Querétaro.....	3,106,665.84	3,099,268.87
San Luis Potosí.....	13,955,433.91	13,189,836.13
Sinaloa.....	5,357,041.80	5,255,783.17
Sonora.....	4,826,321.74	4,554,457.98
Tabasco.....	2,984,446.09	2,975,864.02
Tamaulipas.....	1,595,014.55	1,569,735.96
Tlaxcala.....	1,772,562.05	1,772,825.82
Veracruz.....	6,259,321.33	5,916,584.69
Yucatán.....	6,117,743.30	5,974,789.89
Zacatecas.....	9,926,738.58	9,891,385.40
Total.....	160,141,070.12	153,238,827.41
Federal Treasury.....	471,933,381.41	546,608,816.48
Grand total.....	632,074,451.53	699,847,643.89

WEIGHTS AND MEASURES.

The metric system is in official use in the Republic of México, having been adopted by the Government in the year 1862. It is used to compute all customs and other duties to be paid to the General Government, in the measurement of public lands, and by the railroads in all freight and other transactions, and is exclusively taught in the public schools. The old-time weights and measures were founded on Spanish models, but, owing to the inexactness of the first standards and to subsequent changes, differ at present very widely from their originals. The value of the metric system here assigned to each denomination of the old weights and measures is that fixed by the Mexican Government at the time of the adoption of the metric system. These tables are from the first edition of the Handbook of México, published by the Bureau of the American Republics in 1891. They are reproduced here because the nomenclature of the old system is still in use in publications on México. By law of June 19, 1895, the metric system was declared the only legal system of weights and measures in the country, and became compulsory throughout the Republic on September 16, 1896. The equivalents in American weights and measures were calculated from data found in Trautwine's Pocket Book as to the comparison between French and American weights and measures, and are believed to be correct.

LINEAR MEASURES.

1 legua (league)	= 5,000 varas	= 4.19 kilometers	= 2.604375 miles.
1 vara (yard)	= 3 piés	= 0.83800 meter	= 2.749578 feet.
1 pié (foot)	= 12 pulgadas	= 0.27933 meter	= 0.916526 foot.
1 pulgada (inch)	= 12 lineas	= 0.02328 meter	= 0.916526 inch.
1 linea (line)		= 0.00194 meter	= 0.076377 inch.

The vara is also divided (for dry-goods selling) into palmos or cuartas (palms or quarters).

1 palmo or cuarta = 0.209500 meter = 0.687394 foot = 8.248728 inches.

SUPERFICIAL OR SQUARE MEASURE.

1 square legua	= 1,755.61 hectares	= 4,339.4 acres.
1 square vara	= 0.702244 square meter	= 7.559000 square feet.
1 square pié	= 0.078027 square meter	= 0.839888 square foot.
1 square palmo	= 0.043890 square meter	= 68.03094 square inches.
1 square pulgada	= 0.000542 square meter	= 0.84012 square inch.

Land or agrarian measures.

Spanish name.	Nearest English equivalent.	Length (varas).	Breadth (varas).	Hectares.	Acres.
Hacienda.....	Plantation	25,000	5,000	8,778.0500000	21,697.000
Sitio de ganado mayor	Cow ranch	5,000	5,000	1,755.6100000	4,339.400
Sitio de ganado menor	Sheep ranch	3,333½	3,333½	780.2711111	1,928.133
Fundo legal para pueblo	Legal town site	1,200	1,200	101.1231360	244.140
Labor	Field	1,000	1,000	70.2244000	175.532
Caballería de tierra	Knighthold of land	1,104	552	42.7953111	105.751
Fanega sembradura de maíz	Sowing ground for 1 fanega of corn.	276	184	3.5662759	8.813
Solar para casa, molino, ó venta.	Site for a house, mill, or inn.	50	50	.1755610	.434

HYDROMETRIC MEASURE.

This was used for measuring and distributing water for irrigation and domestic uses:

1 bucy (ox)	= 48 surcos.
1 surco (furrow)	= 3 naranjas.
1 naranja (orange)	= 8 reales or limones.
1 real (bit) or limón (lemon)	= 2 dedos.
1 dedo (finger)	= 9 pajas (straws).

According to the old ordinances of lands and waters established in Spanish times, the *bucy* of water was as much as would flow through an aperture 1 *vara* (0.838 meter) square, no head or pressure being mentioned. By a law of the Mexican Republic of August 2, 1863, 1 *surco* was made equal to 6½ liters per second for rural measures, and the *paja* was made equal to 0.45 liters per minute for town measurements. This distinction was intended to make the *surco* a unit for irrigation, while the *paja* was made the unit for distributing water to houses, etc., in towns.

CUBIC MEASURES.

	Cubic meter.	Cubic yard.
1 cubic <i>cara</i>	= 0.588480	= 0.769734
1 cubic <i>pie</i>	= 0.021795	= 0.769484
1 cubic <i>palmo</i>	= 0.009195	= 0.324634

DRY MEASURES.

	Liters.	Bushels.
1 <i>carga</i> = 2 fanegas	= 181.629775	= 5.154357
1 <i>fanega</i> = 12 almudes	= 90.814888	= 2.577178
1 <i>almud</i> = 4 cuartillos	= 7.567907	= 0.859109
1 <i>cuartillo</i> (quart)	= 1.891977	= 1.718122

OIL MEASURE.

	Liter.	U. S. liquid quart.
1 <i>cuartillo</i>	= 0.506162	= 0.534870

WINE MEASURE.

	Liter.	U. S. liquid quart.
1 <i>cuartillo</i>	= 0.456264	= 0.482140

COMMERCIAL WEIGHTS.

	Kilogrammes.	U. S. pounds avoirdupois.
1 <i>quintal</i> = 4 <i>arrobas</i>	= 46.024634	= 101.444
1 <i>arroba</i> = 25 <i>libras</i>	= 11.506159	= 25.361
1 <i>libra</i> (pound) = 16 <i>onzas</i>	= 0.460246	= 1.01444
1 <i>ouza</i> (ounce) = 16 <i>adarmes</i>	= 0.028765	= 1.0148
1 <i>adarme</i> (dram) = 36 <i>granos</i>	= 0.001798	= 0.06343
1 <i>grano</i> (grain)	= 0.000499	= 0.77160

In commerce there was used the following relation between the kilogramme and the pound (*libra*) different from the ratio as fixed by Government, viz:

1 kilogramme = 2.1733 pounds (*libras*).

There is also a weight called *carga*, used in commerce, in freighting, and in mining:

1 *carga* = 12 *arrobas* = 300 pounds = 138.073902 kilogrammes = 304.332 United States pounds avoirdupois.

PRECIOUS METAL WEIGHTS.

	Kilogramme.	Ounces avoirdupois.
1 <i>marco</i> = 8 <i>onzas</i>	= 0.230123	= 8.1184
1 <i>onza</i> = 8 <i>ochavas</i>	= 0.028765	= 1.0148
1 <i>ochava</i> (eighth) = 6 <i>tomines</i>	= 0.003596	= 0.12685
1 <i>toinin</i> = 12 <i>granos</i>	= 0.000599	= 9.25920
1 <i>grano</i>	= 0.000499	= 0.77160

The following table shows the coins issued by the Mexican mints:

Denomination.	Finceness.	Value in pesos.	Weight in—		Diameter in—	
			Grams.	Troy ounces.	Milli-meters.	Inches.
Gold coins: <i>a</i>						
Double hidalgo	875	20.00	33.841	1.0860	34	1.33858
Hidalgo	875	10.00	16.920	.5430	27	1.06299
Medio hidalgo	875	5.00	8.460	.2715	22	.86611
Cuarto hidalgo	875	2.50	4.230	.13575	18	.70866
Décimo hidalgo	875	1.00	1.692	.05430	15	.59055
Silver coins: <i>a</i>						
Peso	902	1.00	27.073	.866	37	1.45669
50 centavos	902	.50	13.536	.433	30	1.18110
25 centavos	902	.25	6.768	.2165	25	.98425
10 centavos	902	.10	2.707	.0866	17	.66929

a There were formerly coined in gold the onza = \$16 in silver; the media onza = \$8; the pistola = \$4; the escudo de oro = \$2; and the escudito de oro = \$1. In silver, the real = \$0.12½; medio real = \$0.06¼.

CHAMBERS OF COMMERCE.

Below is a list of the chambers of commerce in the United Mexican States at the beginning of the year 1899:

City.	State.	City.	State.
Acapulco	Guerrero.	Pichucalco	Chiapas.
Aguascalientes	Aguascalientes.	Piedra Cavadas	Michoacán.
Ciudad Victoria	Tamaulipas.	Puebla	Puebla.
Ciudad Juárez	Chihuahua.	Puerto de Matamoros	Tamaulipas.
Colima	Colima.	Querétaro	Querétaro.
Córdoba	Veracruz.	Real del Monte	Hidalgo.
Chihuahua	Chihuahua.	San Juan Bautista	Tabasco.
Durango	Durango.	San Luis Potosí	San Luis Potosí.
Ensenada de Todos Santos	Baja California.	San Pedro de Coahuila	Coahuila.
Guadalajara	Jalisco.	Sombrerete	Zacatecas.
Hidalgo del Parral	Coahuila.	Tampico	Tamaulipas.
Isla del Carmen	Campeche.	Tepic	Territorio de Tepic.
León	Guanajuato.	Tlaotalpan	Veracruz.
Matuhuala	San Luis Potosí.	Toluca	México.
Mazatlán	Sinaloa.	Tula de Tamaulipas	Tamaulipas.
México	Distrito Federal.	Tulancingo	Oaxaca.
Morelia	Michoacán.	Tezuatlán	Puebla.
Misantla	Veracruz.	Túxpan	Veracruz.
Orizaba	Do.	Veracruz	Do.
Oaxaca	Oaxaca.	Yucatán	Yucatán.
Papantla	Veracruz.	Zacatecas	Zacatecas.

COST OF LABOR.¹

Wages paid (United States currency) in the City of México in 1896.

[Per day except when otherwise stated.]

Day laborers ²	\$0.08	to \$0.34
Blacksmiths ² .....	.63	to .76
Carpenters (ordinary) .....	.62	to .76
Carpenters (foremen)	1.27	to 2.25
Printers:		
Pressmen .....		.76
Job printers .....		.62
Compositors .....		.72

¹ From special consular report, 1896, Vol. XII, Part I, p. 117. These averages hold good at present with slight variations due to the necessities of the moment.

² The wages of laborers range from 25 to 67 cents per day; wages of blacksmiths range from 75 cents to \$1.50 per day.

Engravers.....	\$2. 25	to \$5. 50
Masons .....	. 57	to . 76
Bricklayers .....	. 51	to . 76
Iron workers	1. 02	to 1. 28
Private coachmen.....per month..	7. 65	to 12. 25
Public coachmen.....do.....		5. 50
Policemen	15. 30	to 25. 50
Wagon drivers .....		. 62
Butchers.....		. 76
Shoemakers.....		. 62
Laborers in factories .....	. 31	to . 51
Skilled mechanics		2. 25
Plumbers	1. 02	to 1. 27
Miners.....	. 31	to . 56
Skilled miners.....	. 51	to . 71
Furnace men, smelters .....	. 51	to . 76
Section men on railroads .....	. 26	to . 31
Section foremen .....	. 51	to . 76
Tailors:		
Repair .....	. 51	to . 63
Coat makers	2. 55	to 6. 10
Vest makers .....	. 65	to . 82
Pants makers .....	. 90	to 1. 28
Harness and saddle makers.....	. 26	to 1. 02

Wages per day paid (United States currency) in the Republic of México in 1896.

Carpenters	\$0. 38	to \$0. 63
Carpenters (foremen) .....	. 89	to 1. 53
Masons .....	. 38	to . 63
Masons (foremen) .....	. 89	to 1. 53
Painters.....	. 38	to . 51
Painters (foremen) .....	. 51	to 1. 02
Miners:		
Ordinary.....	. 31	to . 76
Skilled.....	. 89	to . 91
Hatters .....	. 38	to . 51
Hatters, skilled .....	. 76	to 1. 27
Shoemakers .....	. 89	to 1. 27
Shoemakers (ordinary).....	. 38	to . 89
Blacksmiths (mines).....	. 76	to 1. 53
Carpenters (mines) .....	. 76	to 1. 53
Machinists	1. 53	to 2. 04
Head miners.....	1. 02	to 1. 27
Watchmen .....	. 38	to . 51
Factories:		
Girls and boys.....	. 09	to . 18½
Men .....	. 20½	to . 51
Women .....	. 09	to . 25½

Prices of imported articles of food in the City of México, a

Articles.	Mexican currency.	United States currency.
Ham per pound..	\$0.50	\$0.26
Bacon do.....	.50	.26
Bulk meats..... do.....	\$0.30 to .40	\$0.15½ to .21
Butter do.....	.75	.38
Cheese do.....	.50	.26
Salt, table do.....	.08	.04½
Flour do.....	.15	.08
Sugar do.....	.25	.13
Corn meal do.....	.15	.07½
Hominy do.....	.15	.07½
Oatmeal do.....	.22½	.11½
Soda crackers..... do.....	.45	.23
Rollad wheat..... do.....	.25	.13
Dried apples..... do.....	.35	.17½
Dried peaches..... do.....	.35	.17½
Dried apricots..... do.....	.50	.26
Dried prunes..... do.....	.38	.18½
Canned fruits—apples, peaches, pears, etc..... 2-pound cans..	1.50	.76
Irish potatoes..... per pound..	.05	.02½

a These are average prices subject to fluctuations according to the necessities of the moment.

Prices of agricultural and pastoral products exported in 1896.

Articles.	Mexican currency.	United States currency.
Indigo per pound..	75 cents to \$1.25.	38 to 62 cents.
Sugar, fine..... do.....	10 to 14 cents	5 to 8 cents.
Sugar, brown..... do.....	7 cents.	3½ cents.
Cacao do.....	40 cents.	21 cents.
Tobacco do.....	12, 20, 24, to 28 cents	6, 11, 13 to 14½ cents.
Coffee do.....	25 to 35 cents	13 to 18 cents.
Flour do.....	4 to 6 cents	2 to 3 cents.
Beans do.....	5 cents.	2½ cents.
Wax every 25 pounds..	16 to 20 cents a pound	8 to 13 cents.
Honey every 100 pounds..	20 cents a pound	10½ cents.
Henequén per ton	\$80, gold	
Fiber and cordage per pound	6 cents.	3½ cents.
Oil per 25 pounds.	\$3.	\$1.53.
Rubber per pound	25 cents.	13 cents.
Dyewoods per ton	\$35, gold	
Ixtle per 100 pounds.	\$5.	\$2.55.
Vanilla do.....	\$12 to \$16	\$6.10 to \$8.16.
Lemons..... per 100	20 cents.	11 cents.
Oranges do.....	\$1 to \$1.50	51 to 77 cents.
Bananas..... do.....	60 cents	31 cents.

Retail prices of food products consumed in México and exported in 1896.

Articles.	Mexican currency.	United States currency.
Jerked beef per pound..	\$0.12 to \$0.20	\$0.07 to \$0.12
Fresh beef (cities)..... do.....	.12 to .25	.07 to .13
Fresh beef (ranch)..... do.....	.06	.03½
Fresh pork do.....	.15 to .25	.08 to .13
Salt pork do.....	.25 to .45	.13 to .23
Native hams do.....	.40 to .55	.20 to .28
Flour do.....	.06 to .10	.03½ to .05½
Corn do.....	.01½ to .04	.00½ to .02½
Native beans..... do.....	.07 to .14	.03½ to .08
Native butter..... do.....	.50	.26
Native cheese..... do.....	.25 to .55	.13 to .28
Native soap (laundry)..... do.....	.08 to .15	.05 to .08
Native sugar (white)..... do.....	.08 to .15	.04½ to .08
Native sugar (brown)..... do.....	.04 to .08	.02½ to .04
Coffee (raw)..... do.....	.35 to .45	.18 to .23
Irish potatoes..... do.....	.03 to .07	.01½ to .03½
Rice do.....	.08 to .10	.04½ to .05
Lard do.....	.20 to .26	.11 to .13
Kerosene oil per gallon..	.60 to .75	.31 to .38
Tea (common) per pound..	.50	.26
Tea (good and choice)..... do.....	1.50 to 2.00	.76 to 1.02
Molasses (ordinary) per gallon..	1.00	.57
Wheat:		
Per bushel.....	1.50 to 1.80	.76 to .91

Prices of products consumed in the country.

Products.	Mexican currency.	United States currency.
Wheat.....per pound..	\$0.02 to \$0.04	\$0.01 to \$0.02½
Cotton.....do.....	.13 to .18	.06½ to .09
Wool (choice).....do.....	.60	.31
Butter:		
Ordinary.....do.....	.50	.26
Choice.....do.....	.75	.38
Beans.....do.....	.06	.03
Eggs.....per dozen..	.25	.13
Lard.....per pound..	.16 to .24	.08 to .12
Rice.....do.....	.06 to .08	.03 to .04
Cheese.....do.....	.50	.26
Chick pease.....do.....	.03	.01½
Soap, common.....do.....	.08	.04½
Barley.....do.....	.01½	.00½
Pepper.....do.....	.16	.08½
Sulphur.....do.....	.07 to .10	.03½ to .05½
Grapes.....do.....	.10 to .15	.05 to .08
Beef:		
On ranch.....do.....	.06	.03
Good, in cities.....do.....	.12	.06
Best, in cities.....do.....	.25	.13
In City of México, good.....do.....	.16	.08

Prices of cloths, wearing apparel, etc., imported.

Ginghams.....per 33 inches..	\$0.15 to \$0.20
Shirting.....do.....	.15 to .20
Sheeting.....do.....	.15 to .25
Common cassimeres.....per yard..	1.50
Good cassimeres.....do.....	6.00
Flannels.....per 33 inches..	.75 to 1.25
Woolen shirts.....each..	2.00 to 3.50
Douglas shoes.....per pair..	4.50 to 11.00
Heavy brogans, men's.....do.....	1.50 to 2.50
Men's calf shoes.....do.....	3.50 to 4.50
Men's boots.....do.....	3.00 to 5.00
Men's overalls.....each..	1.20 to 1.50
Men's jean coats.....do.....	2.25 to 3.50
Ordinary wool hats.....do.....	1.00 to 1.50
Good wool hats.....do.....	4.00 to 5.00
Fine wool hats.....do.....	8.00 to 10.00

These prices are for the border towns and in the Free Zone, where tariff duties are light.

TREATIES AND CONVENTIONS.

BELGIUM.

Convention for the extradition of criminals, May 24, 1892.
Treaty of amity, commerce, and navigation, June 7, 1895.

DOMINICAN REPUBLIC.

Treaty of amity, commerce, and navigation, March 29, 1890.

ECUADOR.

Treaty of amity, commerce, and navigation, April 24, 1893.

FRANCE.

Treaty of amity, commerce, and navigation, November 27, 1886.

Parcels post convention, December 10, 1891.

Regulations governing the same, January 22, 1892.

GERMANY.

Treaty of amity, commerce, and navigation, December 5, 1882.

Parcels post convention, May 24, 1892.

Amendment to paragraph 1, article 4, of said convention, November 21, 1894.

GREAT BRITAIN AND IRELAND.

Preliminary to the resumption of diplomatic relations, August 6, 1884.

Treaty for the extradition of criminals, September 7, 1886.

Treaty of amity, commerce, and navigation, November 27, 1888.

Parcels post convention, February 15, 1889.

Regulations governing same, March 12, 1890.

Regulations governing fiscal officers in connection with postal authorities, in fulfilment of the above-mentioned postal treaty, March 12, 1890.

Treaty of boundaries between Yucatán and Belize (British Honduras), July 8, 1893.

GUATEMALA.

Preliminary convention on boundaries, December 7, 1877.

Act extending the period fixed in article 8 of said convention, May 3, 1879.

Convention for the prorogation of the periods named in articles 7 and 8 of said convention, March 3, 1879.

Treaty of boundaries, September 27, 1882.

Convention extending for one year the period fixed by the above-mentioned treaty, June 8, 1885.

Convention extending the period fixed for the conclusion of the work of the joint commission on boundaries, October 6, 1886.

Convention for the same purpose, October 20, 1890.

Claims convention, January 26, 1888.

Convention extending the period for the conclusion of the work of the boundary commission, October 22, 1888.

Convention for the same purpose, October 20, 1890.

Claims convention, December 22, 1891.

Convention for the extradition of criminals, May 19, 1894.

Convention on boundaries, July 10, 1894.

Adjustment of the difficulties arising from the exercise of acts of sovereignty in Mexican territory, April 1, 1895.

Convention extending the period within which the boundary line must be drawn, March 16, 1896.

Convention for the same purpose, October 6, 1897.

ITALY.

Convention to determine the nationality of Mexicans born in Italy and Italians born in México, August 20, 1888.

Treaty of amity, commerce, and navigation, April 24, 1893.

JAPAN.

Treaty of amity, commerce, and navigation, April 24, 1893.

SWEDEN AND NORWAY.

Treaty of amity, commerce, and navigation, July 29, 1885.

UNITED STATES OF AMERICA.

Treaty of limits, concluded January 12, 1828, proclaimed April 5, 1832.

Treaty of limits, concluded April 5, 1831, proclaimed April 5, 1832.

Treaty of amity, commerce, and navigation, concluded April 5, 1831, proclaimed April 5, 1832.

Treaty of limits, concluded April 3, 1835, proclaimed April 21, 1836.

Claims convention, concluded April 11, 1839, proclaimed April 8, 1840.

Claims convention, concluded January 30, 1843, proclaimed March 31, 1843.

Treaty of peace, friendship, limits, and settlement (treaty of Guadalupe Hidalgo), concluded February 2, 1848, proclaimed July 4, 1848.

Treaty of boundary, cession of territory, transit of Isthmus of Tehuantepec, etc. (Gadsden treaty), concluded December 30, 1853, proclaimed June 30, 1854.

Extradition treaty, concluded December 11, 1861, proclaimed June 30, 1862.

Claims convention, concluded July 4, 1868, proclaimed February 1, 1869.

Naturalization convention, concluded July 10, 1868, proclaimed February 1, 1869.

Claims convention, concluded April 19, 1871, proclaimed February 8, 1872.

Claims convention, concluded November 27, 1872, proclaimed July 24, 1873.

Claims convention, concluded November 20, 1874, proclaimed January 28, 1875.

Claims convention, concluded April 29, 1876, proclaimed June 29, 1876.

Boundary convention, concluded July 29, 1882, proclaimed March 5, 1883.

Commercial reciprocity convention, concluded January 20, 1883, proclaimed June 2, 1884.

Boundary convention, Rio Grande and Rio Colorado, concluded November 12, 1884, proclaimed September 14, 1886.

Reciprocity convention, concluded February 25, 1885, proclaimed May 4, 1886.

Boundary convention, concluded December 5, 1885, proclaimed June 28, 1887.

Reciprocity convention, concluded May 14, 1886, proclaimed February 1, 1887.

Boundary convention, concluded February 18, 1889, proclaimed October 14, 1889.

Boundary convention, concluded March 1, 1889, proclaimed December 26, 1890.

Boundary convention, concluded August 24, 1894, proclaimed October 18, 1894.

Boundary convention, concluded October 1, 1895, proclaimed December 21, 1895.

Boundary convention, concluded November 6, 1896, proclaimed December 23, 1896.

Boundary convention, concluded October 29, 1897, proclaimed December 21, 1897.

Boundary convention, concluded December 2, 1898, proclaimed February 3, 1899.

CHAPTER XX.

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CARTOGRAPHY.¹

LIST OF MAPS OF MEXICO FROM 1858 TO 1898.

By P. Lee Phillips, *Chief of Maps and Charts Division, Library of Congress*.

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NOTE.—Pages 35-53 contain a list of maps of México to 1860.

Orozco y Berra (Manuel). *Materiales para una cartografía Mexicana*. Edición de la Sociedad de Geografía y Estadística. xii, 337 pp. 1 l. 8°. México, imprenta del gobierno, 1871. L. C.

1858.

Atlas geográfico, estadístico é histórico de la república Mexicana, formado por Antonio García Cubas. 3 p. l. 31 maps. 2 pl. 4, 18 pp. + 1 l. fol. México, J. M. Fernandez de Lara, 1888.

List of maps.

- Carta 1. Carta general reducida.
2. Sonora.
3. Chihuahua.
4. Coahuila.
5. Nuevo Leon.
6. Tamaulipas.
7. San Luis Potosí.
8. Zacatecas.

¹ The initials L. C. stand for Library of Congress, Washington.

Carta 9. Aguascalientes.

10. Durango.

11. Sinaloa.

12. Jalisco.

13. Guanajuato.

14. Michoacán.

15. Querétaro.

16. México.

17. Valle de México.

18. Puebla.

19. Veracruz.

20. Guerrero.

21. Oaxaca.

22. Chiapas.

23. Tabasco.

24. Yucatán.

25. Baja California.

26. Sierra Gorda.

27. Colima.

28. Tlaxcala.

29. Tehuantepec.

30. Territorios de Sierragorda é isla del Carmen.

31. Carta general de la República Mexicana.

Cuadro 1. Cuadro histórico-geroglífico de la peregrinación de las tribus Aztecas.

2. Cuadro histórico-geroglífico de la peregrinación de las tribus Aztecas que poblaron el valle de México.

L. C.

1858.

H. Kiepert's karte des nördlichen tropischen America. A new map of tropical America north of the equator, comprising the West Indies, Central America, Mexico, New Granada, and Venezuela. col. 38 x 63, fold. obl. 4°. Berlin, D. Reimer, 1858.

L. C.

1859.

Map of the United States and Mexico. Published by Johnson & Browning, under the direction of Col. Carlos Butterfield. Dec., 1859. col. fold. 30 x 36. [New York, 1859.]

L. C.

1861.

Carta general de la república Mexicana. 10½ x 16. [In García Cubas (Antonio). Compendio de geografia. 16°. México, 1861.]

L. C.

1861.

Memoria para servir à la carta general de la República Mexicana. Publicada por Antonio García Cubas. 168 pp. 1 l. 1 fold. map. 8°. México, Andrade & Escalante, 1861.

L. C.

1861.

Colton (J. H.).—Colton's map of the United States, Mexico, the West Indies, &c., 1861. col. 30 x 37, fold. 18°. [New York, J. H. Colton & co., 1861.]

L. C.

1862.

Carte du Mexique représentant le plateau de l'Anahuac et son versant oriental par Hi. de Saussure, 1862. 22 x 21.

[In Société de géographie de Genève. Mémoires. 8°. Genève, 1862. v. 3, p. 60.]

L. C.

1862.

Carte du Mexique, 1:5800000, par J. Barthélemi. Paris, 1862, très gr. in-folio, coloriée.

1862.

Carte du Mexique, 1:4900000, par L. Sagasan. 1862, très gr. in-folio, coloriée.

1862.

Carta hidrográfica del valle de México. Levantada de orden del Ministerio de Fomento por los ingenieros Miguel Iglesias, Ramón Almaraz, Mariano Santa-María y José Antonio de la Peña, bajo la dirección Ingeniero Geógrafo Francisco Díaz Covarrubias, antiguos alumnos del Colegio Nacional de Minería. 1862. 42½ x 26. Mexico, H. Salazar, 1863. L. C.

1862.

Der mexicanische staat Puebla. Vollständige Reduction der Original-Aufnahme vom Baron Ferdinand von Heldtrich (Officier früher in k. preuss. dann in mexican. d.) publiciert in 4 bl. (Massstab 1:232,500) unt. d. titel: Carta del departamento de Puebla levantado de orden del Gobierno Supremo de la República Mexicana por R. Almazán, 1855. Imprenta litográfica de A. Castellero, Puebla. Redigirt v. H. Kiepert. Massstab der reduction 1:500,000. 23½ x 23½.

[In Gesellschaft für Erdkunde zu Berlin. Zeitschrift. Neue folge. 8°. Berlin, D. Reimer, 1862. v. 13. pl. 5.]

L. C.

1862.

Karte der 3 Staaten M., Puebla und Vera Cruz. ([Style on cover] Karte des Kriegsschauplatzes zwischen Veracruz und Mexico,) mit dem Stadtplan von M. E. Jäger: Stuttgart, 1862.

The plan of the City of Mexico is printed on the back of the map.

British Museum.

1862.

Map of Mexico constructed from all available materials and corrected to 1862. By H. Kiepert.—H. Kiepert's karte von Mexico, überbruck aus desselben karte des nördlichen tropischen America in 6 bl. 1856 mit neuen berichtigungen 1862. 22 x 27. fold. 8°. Berlin, D. Reimer, 1862.

L. C.

1862.

Nouvelle Carte du Mexique, donnant le Port de la Vera-Cruz, les environs de M., la partie Sud-Est des États-Unis, la mer des Antilles et l'Amérique Centrale. Dressée par A. Vuillemin . . . (Détails des Environs de M. et de la Vera-Cruz. La Guadeloupe. La Martinique.) J. Barthelemier: Paris, 1862.

British Museum.

1862.

Plan de Mexico et de ses environs dans un rayon de huit kilomètres. Gravé chez Erhard. 16½ x 11. [In Nouvelles annales des voyages. 6me série. 8°. Paris, 1863, v. 33, p. 5.]

NOTE.—Iuset—"Esquisse de l'itinéraire de la Vera-Cruz à Mexico d'après H. Kiepert."

L. C.

1862.

Umgebung von Mexico bis Veracruz nach den von A. v. Humboldt, v. Gerolt, Heller, Smith und der Sociedad Mexicana de Geografia y Estadística veröffentlichten Karten und der Aufnahme des States Puebla von Ahnazan und F. v. Heldreich, zusammengestellt v. H. Kiepert. $6\frac{3}{4} \times 9\frac{1}{2}$.

In Gesellschaft für Erdkunde zu Berlin. Zeitschrift. Neue Folge. 8°. Berlin, D. Reimer, 1862. v. 12. pl. 6.]

L. C.

1863.

Carta general de la república Mexicana, formada por Antonio García Cubas. 1863. 47×56 . México, H. Iriarte & ca., 1863.

L. C.

1863.

Carte de la Sonora, avec l'indication de ses mines d'après la carte de A. García Cubas et les cartes américaines par V. A. Malte-Brun. $9\frac{1}{2} \times 8$.

[In *Nouvelles annales des voyages*. 186. 6^{me} série. 8°. Paris, A. Bertrand, [1865], p. 256.]

NOTE.—Same map found in 177–187. 6^{me} série. 33–34. 1863.

L. C.

1863.

Carte de la Sonora, avec l'indication de ses mines d'après la carte de A. García Cubas et les cartes américaines par V. A. Malte-Brun. Gravé chez Erhard. $9\frac{1}{2} \times 7\frac{3}{4}$.

[In *Nouvelles annales des voyages*. 6^{me} série. 8°. Paris, 1863, v. 34, p. 129.]

L. C.

1863?

Mexico und die Republiken von Central-America. Bearbeitet von C. Gräf. (Tehuantepec Eisenbahn-Projekt. Bearbeitet von Barnard, 1851. Honduras. Eisenbahn-Projekt. Bearbeitet von E. G. Squier u. W. N. Jeffers, 1853.) Weimar, [1863?] British Museum.

1863.

Plan de Mexico et des environs dans un rayon de huit kilomètres. [Also] Esquisse de l'itinéraire de la Vera-Cruz à Mexico d'après H. Kiepert. $16\frac{1}{2} \times 11$.

[In *Nouvelles annales des voyages*. 177–178. 6^{me} série. 33–34. 8°. Paris, A. Bertrand, 1863.]

NOTE.—This map also found in "Revue maritime et coloniale," 1863, v. 7, p. 692.

L. C.

1864.

Essai d'une carte ethnographique du Mexique d'après les travaux de Clavigero, de Humboldt, de Beltrami, de Stephens, de Duflot de Mofras et de Brasseur de Bourbourg par V. A. Malte-Brun, 1864. Echelles au 1:7000000. Gravé chez Erhard. $13 \times 18\frac{1}{2}$.

[In *Nouvelles annales des voyages*. 6^{me} série. 8°. Paris, 1864, v. 39, p. 5.]

NOTE.—Inset—"Vallée de Mexico."

L. C.

1864.

Geological map and profiles of some of the principal mining districts of Mexico. Scale of 12 miles to 1 inch or 1:760320. 2 maps, each 23×28 .

[In Egloffstein (F. W.). *Contributions to the geology and the physical geography of Mexico*. 8°. New York, D. Appleton & Co., 1864, at end.]

NOTE.—"Egloffstein is only the editor. The true author of the geological map, profiles, and descriptions is Baron Frederick von Gerolt, formerly Prussian minister at Mexico and afterwards at Washington."

1865.

Carta general del Imperio Mexicano. Formada y corregida con presencia de los últimos datos y el auxilio de las autoridades más competentes. Decaen y Debray, editores. Col. fold., 31×45 . México, Decaen & Debray, 1865. L. C.

1865.

Itinéraire de Mexico à Durango, dessiné par E. Picard d'après les croquis de route de l'abbé Domenech. 1865. 12 x 17.

[In Société de géographie. Bulletin. 5^e série. 8°. Paris, 1866, v. 12, p. 272.]

L. C.

1865.

Schönberg's map of Mexico. Fold. 14 x 23. [New York, Schönberg & Co., 1865.]

L. C.

1867.

Johnson's Mexico. Col. 11½ x 17. New York, A. J. Johnson [1867].

L. C.

1867.

Nouvelle carte du Mexique, du Texas et d'une partie des États limitrophes . . . par H. Brué . . . Revue et augmentée par A. Vuillemin. (Détails des environs de Mexico et de la Vera-Cruz. Complément de la carte, donnant le Yucatan et une partie des provinces unies de l'Amérique Centrale.) Paris, 1867.

British Museum.

1867.

Plano de la ciudad de México. Levantado de orden del Ministerio de Fomento por sus ingenieros. 1867. 28 x 39½. México, E. M. Sagredo, [1867].

L. C.

1867.

Traveling and military map of Sonora. From private field notes by Cummings & James Cherry. 27 x 30. [Pittsburg, Cummings & J. Cherry, 1867.]

L. C.

1868.

Map of Lower California. From special surveys of coast and interior, made for the Lower California Company in 1866-67. By the company's engineers, under direction of J. Ross Browne. Drawn by Joseph Goldscheider, civil engineer and topographer, January, 1868. 17¾ x 14¾. [New York, N. Y. Lith. and Printing Co.] 1868.

L. C.

1868.

Originalkarte der californischen Halbinsel nach den Aufnahmen der für die Lower California Company ausgeführten Expedition unter J. Ross Browne, W. M. Gabb und F. Loehs [etc.], 13 x 9. Gotha, J. Perthes, 1868.

[In Petermann (A.) Mittheilungen. 4°. Gotha, J. Perthes. 1868, pl. 14, p. 272.]

L. C.

1868.

Plano corográfico de una parte del Estado de Campeche, que comprende todo el margen derecho del río Usumacinta hasta sus confines, en el que está incluso el partido del Cármen. Formado por el agrimensor geómetra F. R. Shiels, 1868. 25 x 21.

[In Sociedad de Geografía y Estadística de la República Mexicana. Boletín. Segunda época. 4°. México, J. M. Sandoval. 1870, v. 2, at end.]

L. C.

1869.

Carta general de la República Mexicana. 15 x 20 inches.

[In García Cubas (Antonio). Curso elemental de geografía universal. 8°. México, 1869.]

L. C.

1869.

Carta general de la República Mexicana. 19½ x 26½.

[In México y sus alrededores. Fol. México, V. Debray, 1869.]

L. C.

1869.

Plano general de la ciudad de México. 1869. Escala de 1,000 varas castellanas. 24 x 32.

[In México y sus alrededores. Nueva edición aumentada. Fol. México, V. Debray, 1869. L. C.]

1870.

Carta general de la República Mexicana. Formada y corregida en vista de los últimos datos. Escala de leguas mexicanas de 26 y $\frac{1}{2}$ al grado. 20 x 26 $\frac{1}{2}$.

[In México y sus alrededores. Nueva edición aumentada. Fol. México, V. Debray, 1869.] L. C.]

1871.

Carte du chemin de fer interocéanique de México (la grande ligne naturelle entre l'Europe et l'Asie) et du chemin de fer interamérique (la grande ligne naturelle entre l'Amérique du Nord et l'Amérique de Sud). Léon, auteur, constructeur et propriétaire. 22 x 28 $\frac{1}{2}$. [New York, G. W. & C. B. Colton & Co., 1871.]

L. C.

1873.

Carte du Mexique. Dressée au dépôt de la guerre, par Mr. Niox, capitaine d'état-major. D'après les levés des officiers du corps expéditionnaire et les renseignements recueillis par le Bureau Topographique. Echelle=1: 3000000. Paris. 1873.

Published by authority of the honorable Secretary of War in the office of the Chief of Engineers, U. S. Army. 27 $\frac{1}{2}$ by 41 $\frac{1}{2}$. [Washington.] 1881.

1873.

Carta geográfica y administrativa de los Estados Unidos Mexicanos, formada con presencia de los datos más exactos y recientes, por el ingeniero Antonio García Cubas . . . 1873. 1: 2000000.

1873-1874.

Carte du Mexique, dressée au dépôt de la guerre. Par Mr. Niox, d'après les levés des officiers du corps expéditionnaire et les renseignements recueillis par le Bureau Topographique. 2 sheets fold. 28 by 41. Paris, ve. Ethion-Pérou, 1873. [And] Notice sur la carte du Mexique. Extrait du Bulletin de la Société de Géographie. Anon. 22 pp. 8°. Paris, J. Dumaine. 1874.

L. C.

1873-1875.

C. Dewey's Aufnahme der Californischen Habinsel unter der Mexikanischen Küsten 1873-74. Von A. Petermann. 21 by 7 $\frac{1}{2}$. Gotha, J. Perthes. 1875.

[In Petermann (A.) Mittheilungen. 4°. Gotha, J. Perthes. 1875. v. 21, pl. 9.]

L. C.

1874.

Atlas metódico para la enseñanza de la geografía de la República Mexicana . . . A. García Cubas. México. 1874.

L. C.

1874.

Case's map of the United States, British Provinces, Mexico, and part of the West Indies. Col. 60 by 70. Hartford, O. D. Case & Co. 1874.

L. C.

1874.

Cram's railroad and county map of the United States, Canada, and Mexico. 38 by 54. Chicago, G. F. Cram. 1874.

NOTE.—On the reverse side is an historical map of the world.

L. C.

1874.

The granger's map of the United States, British Provinces. West Indies, Mexico, and Central America. [By Gaylord Watson, anon.] 38 by 50. Chicago, Watson's Chicago branch. 1874.

L. C.

1876.

Map of the three great tropical American railways, viz: 1st. The Yucatan Central. 2d. The Yucatan Pacific. 3d. The Great Central and Southern American. Leon and Harriet Lewis, projectors, builders, and proprietors.

Prepared by G. W. & C. B. Colton & Co. 22 x 28. [New York, G. W. & C. B. Colton & Co., 1876.]

L. C.

1876.

William's [G. W.] copperplate map of the United States, Canada, Mexico, Central America, West Indies, etc. 63 x 63. Philadelphia, J. M. Atwood. [1876.]

L. C.

1877.

Carta administrativa-itineraria de la republica Mexicana. Secretaria de Estado y del Despacho de Fomento. Comisión de cartografia, bajo la direccion del ing. A. Diaz. No. 1. Expendio, en el archivo de cartas. Constr-y-dib.-C. Alvarez y R. Tangassilit-Salazar. Ia. edicion, 1877. 17½ x 23¾. [México.] 1877.

L. C.

1877.

Republica Mexicana. Plano del Istmo de Tehuantepec. 1:250000. Government of Mexico. 1877.

U. S. War Dept. lib.

1878.

Karte der Habinsel Yucatan, hauptsächlich nach der von Joachin Hübbe und Andres Aznar Perez zusammengestellten und von C. Hermann Berendt revidirten und vermehrten mapa de la peninsula de Yucatan, von 1878. 13 x 17½. Maassstab 1:1600000.

[In Petermann's Mittheilungen. 1879. 4°. Gotha, J. Perthes [1879]. v. 25, pl. 11 at end.]

L. C.

1879.

New map of Mexico, engraved expressly for "Lester's Mexican Republic." 1879. Prepared by G. W. & C. B. Colton & Co. [1879.]

L. C.

1879.

Voyage en Sonora (Mexique) par A. Pinart, 1879. Echelle de 1:4000000. 4½ x 5½.

In Société de géographie. Bulletin. 6^e série. 8°. Paris, 1880. v. 20, at end.]

1880.

Mexico and Central America. By W. Hughes. (Enlarged Plan of the Isthmus of Panama.) G. Philip & Son: London and Liverpool [1880 ?].

British Museum.

1881.

Cram's new indexed county and railroad map of the United States, Canada, and Mexico. Compiled from official records of the land department of Washington, D. C. Drawn and engraved by G. F. Cram. 49 x 80. Chicago, G. F. Cram. 1881.

L. C.

1881.

Map of Mexico, Central America, and Isthmus of Panama, showing railroads, proposed railroads, etc. $37\frac{1}{2} \times 56\frac{3}{4}$. New York, G. Watson. 1881.

L. C.

1881.

Map of the Mexican National Railway, showing the lines granted by the Mexican Government to the Mexican National Construction Company. (Palmer-Sullivan concession.) From the map of Captain Nioux [Niox], published in the office of the Chief of Engineers, U. S. A. 1881. Scale, 1:3000000. $27\frac{3}{4} \times 41\frac{1}{2}$. Washington. 1881.

NOTE.—Inset "Map showing the political divisions."

L. C.

1881.

Nuevo mapa de los estados de Sonora, Chihuahua, Sinaloa, Durango y territorios de la Baja California. Formada par G. de Fleury. 24×34 . San Francisco, published by A. Gensoul, revised by W. Holt. 1881.

L. C.

1881-1882.

Official map of southern Arizona and of the States of Sonora, Chihuahua, Sinaloa, Durango. Prepared especially for the mining record. Compiled from surveys, reconnoissances, and other sources, by Guillermo Rose. 1882. 26×34 . New York, J. Bien, photo. [1881.]

L. C.

1882.

"Commercial Herald." The southwestern railroad system, United States and Mexico. Supplement to the "Commercial Herald" and "Market Review." Jan., 1882. 22×34 . San Francisco, H. S. Crocker & Co. [1882.]

L. C.

1882.

Karte der Vereinigten Staaten von Nord-Amerika nebst Mexico . . . Entworfen von Dr. J. M. Ziegler. Gezeichnet von T. von Bomsdorff. 1882.

British Museum.

1882.

Map of Sinaloa with statistical and geological notes. By Frederick G. Weidner. 1 pl. 19 pp. 1 map, $35\frac{1}{2} \times 29$, fold. 8°. San Francisco, Francis, Valentine & Co. [1882].

L. C.

1882.

Map of the Republic of Mexico. Revised and corrected by Lorenzo Castro, drawn by Theodore Gentilz. 30×44 . New York, Thompson & Moreau [1882].

[In Castro (Lorenzo). The Republic of Mexico in 1882. 12°. New York, 1882.]

L. C.

1882.

Nuevo mapa estadístico y ferrocarrillero de México y la frontera del norte.—New statistical and railroad map of Mexico and the northern frontier. Showing the products of the different zones [etc.], by A. K. Owen and Albert von Motz. 1882. col. 44×60 . Philadelphia, J. L. Smith, 1882.

L. C.

1883.

Dahlgren (Charles Bunker). Historic mines of Mexico. 1 p. l. 220 pp. 2 portraits. 20 maps. 8°. New York, for the author, 1883.

List of maps.

Hysometric map of the Republic of Mexico.
Production map.

Map of Central Mexico (Guanajuato, Zacatecas, and S. Luis-Potosí).
 Map of Guanajuato and Veta Madre.
 Section of Valenciana.
 Map of Veta Grande (Zacatecas), Descubridora, and Quebradilla.
 Map of Pinos.
 Map of Fresnillo.
 Map of Sombretete.
 Map of Catorce.
 Map of Northwestern Mexico (Sonora, Sinaloa, Chihuahua, Durango).
 Map of Guadalupe de los Reyes.
 Map of Rosario.
 Map of Batopilas.
 Map of Parral.
 Map of Cusiuhiriachic.
 Map of San Dimas.
 Map of Southern Mexico.
 Map of Tlalpujahua.
 Map of Pachuca and Real del Monte.

1883.

El Corazon del Anahuac y sus ferrocarriles. 1:250000. 1883. Published by the
 Major & Knapp Eng. and Mfg. and Lith. Co., N. Y. U. S. war dept. lib.

1883.

Map of the Texas, Topolobampo and Pacific R. R. and Tel. Co., from Chihuahua
 and Parral to Topolobampo Harbor. 1:5280 (about 12 miles to the inch). Albert
 von Motz. Published by T. T. & P. R. R. Tel. Co., 1883.
 U. S. War Dept. Lib.

1883.

Steamship line and railroad map of the Merchants' and Tourists' Guide to Mexico.
 13 x 19. Chicago, C. W. Laremba, 1883. L. C.

1883.

Watson's nuevo mapa de México y la frontera del Norte, América Central, Istmo de
 Panamá, Cuba, Jamaica, and Bahama Islands. 38 x 55. Nueva York, G. Wat-
 son, 1883. L. C.

1883-1884.

Memoria presentada al Congreso de la Unión por el Secretario de Estado y del Des-
 pacho de Fomento, Colonización, Industria y Comercio de la República Mexicana,
 General Carlos Pacheco. Corresponde á los años transcurridos de enero de 1883
 de 1885. V. 6. Atlas. 2 p. 1. 48 maps. fol. México: Oficina tipográfica de
 la secretaría de fomento, 1887.

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Carta general telegráfica de los Estados Unidos Mexicanos, comprendiendo lo construido y en
 explotación en las diversas líneas hasta junio de 1885.

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 16. Mapa del cantón Jiménez. Estado de Chihuahua.
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 19. Ferrocarril Hidalgo. Proyecto para el ensanche de la estación de Pachuca y alineamiento del camino que conduce á México.
 20. Ferrocarril de Mérida á Calkiní. Proyecto de estación en Umán.
 21. Ferrocarril de Puebla á Izúcar de Matamoros. Sección 1ª de Puebla á Cholula. Proyecto del Puente de la Unión sobre el río Atoyac.
 22. Ferrocarril de Puebla á Izúcar de Matamoros. Sección 2ª de Cholula á Atlixco. 2º tramo. Puente de Teyecatl.
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 27. Plano topográfico del río Conchos en una zona de dos kilómetros á cada lado de la línea del puente del Ferrocarril central mexicano.
 28. Plano general del puente sobre el río Conchos.
 29. Puente sobre el río Salto. Ferrocarril central. División de San Luis Potosí á Tampico.
 30. Detalles del puente sobre el río Salto. Ferrocarril central mexicano.
 31. Ferrocarril central. División de San Luis Potosí á Tampico. Pilares del centro y del este del puente sobre el río Salto, en Santa Rosa.
 32. Ferrocarril central. División de San Luis Potosí á Tampico. Estribo oeste del puente sobre el río Salto, en Santa Rosa.
 33. Ferrocarril central. División de San Luis Potosí á Tampico. Plano y detalles del puente provisional, sobre un agujero en el kilómetro 118.
 34. Ferrocarril central. División de San Luis Potosí á Tampico. Plano y detalles del puente de Palastro proyectado sobre un agujero en la est. 4,715, kilómetro 118.
 35. Ferrocarril central. Mampostería y cimientos para el puente sobre el río Tamasopo.
 36. Ferrocarril central mexicano. División de Tampico. Puente sobre el río Choy.
 37. Ferrocarril central mexicano. Línea del Pacífico. División oriental. Líneas y reconocimientos entre Guadalajara y Lagos.
 38. Ferrocarril de Puebla á San Márcos y Villa de Libres. Puente en la barranca de Xaleatl. Tercera sección.
 39. Rada de Salina Cruz.
 40. Proyecto de muelle para el puerto de Salina Cruz.
 41. Canal n. del Chijol. Proyecto de trazo final para someterlo á la aprobación del Supremo Gobierno.
 42. Faro y torre para el puerto de Guaymas, establecidos por la Compañía del ferrocarril de Sonora.
 43. Plano de una parte del estado de Colima. Proyecto de saneamiento para el puerto de Manzanillo.
 44. Muelle para el puerto de Manzanillo.
 45. Muelle para el puerto de Manzanillo.
 46. Muelle para el puerto de Manzanillo.
 47. Proyecto de monumento á la memoria de Sor. Juana Inés de la Cruz.

1884.

Carta ferrocarrilera de México, con los datos más recientes acerca de unas y otras líneas. Expresamente formada por ingenieros de la Secretaría de Fomento del Gobierno Federal para el primer almanaque histórico, artístico y monumental de la República Mexicana. Publicado por Manuel Caballero, editor de "El Noticioso," México. Scale: 1:3800000. $23\frac{3}{4} \times 35\frac{1}{2}$. New York, G. W. & C. B. Colton & Co. [1884].

L. C.

1884.

Carta topográfica general de los Alrededores de Puebla, formada por la Comisión geográfico-exploradora. 1:50000. Published by Mexican Government, 1884. 3d serie 6a. A. P.

U. S. War Dept. Lib.

1884.

Der Staat Sinaloa in Mexico. Nach eigenen aufnahmen und rekognoscirungen von Friedrich G. Weidner. $16\frac{1}{2} \times 13\frac{1}{2}$. Gotha, J. Perthes, 1884.

[In Petermann (J.) Mittheilungen. 4^o. Gotha, 1884, v. 30. pl. 1.]

L. C.

1884.

General map of the Republic of Mexico, showing railroads, steamships, and telegraph communications. 1:2217600. Published by Rand & McNally, Chicago, 1884. Corrected to 1884. In four sheets.

U. S. War Dept. Lib.

1884

Carta topográfica general de los alrededores de Puebla. Formada por la Comisión Geográfico-exploradora. Secretaría de Estado y del Despacho de Guerra y Marina. Comisión geográfica de fomento y guerra. Bajo la dirección del ing. Al Diaz. Levantamiento: varios individuos de la comisión. Construcción: cap. 1^o E. M.—Beltran. Dibujo y escrituras: Ing. C. T. Alvarez. Edición de 1884. 3a serie. Letra A. P. $19\frac{1}{2} \times 25\frac{3}{4}$. Escala de 1:50000—I^{mm}=50 metros.

L. C.

1884.

Mapa de la red telegráfica y de los itinerarios generales la República Mexicana. Formado según datos oficiales por F. A. Labadie. $21\frac{1}{4} \times 27\frac{1}{2}$. San Francisco, Cal. Gregoire, Tanzy y ca. [1884.]

NOTE.—Another copy in the library traced on linen.

L. C.

1884.

Mexico, Central America, and the West Indies. Drawn and engraved expressly for the Encyclopædia Britannica, American reprint. Scale 95 miles—one inch. 19 x 27. Philadelphia, J. M. Stoddart Co., [1884].

NOTE.—Copyright in 1884 by Roger Sherman.

L. C.

1884.

México. Mapa de las líneas del ferrocarril central y conexiones. Escala del mapa 1:6000000. $14\frac{1}{2} \times 20\frac{1}{2}$. Buffalo, N. Y.: Matthews, Northrup & Co. 1884.

NOTE.—Copyrighted by the Mexican Central Railway Co., Limited, 1884.

1884.

Mexique. Échelle, 1:5000000.

[In Vivien de St. Martin (Louis). Atlas universel de géographie, fol. Paris, Hachette, 1884. Pt. 73.]

L. C.

1884.

Poole Bros. Railway map of Mexico. $14\frac{1}{2} \times 20\frac{1}{2}$. [Chicago, Poole Bros., 1884.] -
L. C.

1884.

Watson's nuevo mapa de México y la frontera del Norte, América Central, Istmo de
Panama, Cuba, Jamaica y islas de Bahama. 37×54 . Nueva York, G. Watson,
1884. L. C.

1884-1889. .

International (water) Boundary Commission. United States and Mexico. Treaties
of 1884 and 1889. Brownsville and Matamoras jetties, report of Col. Anson
Mills, 3d U. S. Cav. Maps by engineers of commission and Capt. M. M. Men-
diola, Mexican engineer. Wash., 19, 5 pl., 5 sheets of maps.

No. 1, reference map, showing Rio Grande and vicinity of Brownsville, with river as
located by the commission of 1883. Scale, 1:5000. No. 2, Rio Grande sections and cross-
sections at Fortín Paredes and Freeport. Scale, 1:1000. No. 3, Rio Grande, jetties and cross-
sections in the vicinity of Brownsville, Texas and Matamoras. Tamaulipas, Dec. 1894. Scale,
1:1000. No. 4, Bends of the Rio Grande at Casa Matar and artillery quarters. Scale, 1:1000.
No. 5, comparative map of river and jetties in the vicinity of Brownsville, Fort Brown, and
Santa Cruz Point, showing the surveys of 1853, 1869, 1875, 1877, 1880-82, 1894. Scale, 1:2000.

U. S. War Dept. Lib.

1885.

Atlas Mexicano por Antonio García Cubas. 31 sheets incl. Carta General, fol.
México, Debray, suc's 1885.

Contents.

- Carta 1. Sonora. Escala 1:2000000.
2. Chihuahua. Escala 1:2000000.
3. Coahuila. Escala 1:2000000.
4. Nuevo Leon. Escala 1:1200000.
5. Tamaulipas. Escala 1:1500000.
6. Veracruz. Escala 1:1200000.
7. Tabasco. Escala 1:1200000.
8. Campeche. Escala 1:1200000.
9. Yucatán. Escala 1:1200000.
10. Sinaloa. Escala 1:1500000.
11. Jalisco. Escala 1:1500000.
12. Colima. Escala 1:500000.
13. Michoacán. Escala 1:1000000.
14. Guerrero. Escala 1:1000000.
15. Oaxaca. Escala 1:100000.
16. Chiapas. Escala 1:1200000.
17. Durango. Escala 1:1200000.
18. Zacatecas. Escala 1:1200000.
19. Aguascalientes. Escala 1:300000.
20. San Luis Potosí. Escala 1:1325000.
21. Guanajuato. Escala 1:600000.
22. Querétaro. Escala 1:480000.
23. Hidalgo. Escala 1:600000.
24. México. Escala 1:500000.
25. Morelos. Escala 1:250000.
26. Puebla. Escala 1:900000.
27. Tlaxcala. Escala. 1:230000.
28. Baja California. Escala 1:3000000.
29. Distrito Federal. Escala 1:245000.
30. Territorio de Tepic.

1885.

Map of the City of Mexico, authorized for publication with the Mexican guide, by
General Carlos Pacheco, Minister of Public Works. 1885. 17×24 .

[In Janvier (Thomas A.) The Mexican guide, 5th ed. 16°. New York, C. Scribner's Sons,
1890. at end.]

L. C.

1885.

Map of the United States and Territories, with adjacent parts of Canada and Mexico; also part of the West Indies. 1:2534400. (40 miles to the inch.) U. S. General Land Office. 1885.

U. S. War Dept. Lib.

1885.

Mapa general de México. Ferrocarril Central, México. 1885. (Blue print, 1 sheet.)

U. S. War Dept. Lib.

1885.

Official map of the State of Sonora. 1885. By Chas. E. Herbert. 23 x 27. 1 sheet fold. 18°. [n. p. 1885.]

NOTE.—On cover date, 1884. Title in Spanish and English.

L. C.

1886.

Map of the environs of the City of Mexico. Authorized for publication with the Mexican Guide, by General Carlos Pacheco, Minister of Public Works. 1886. 11½ x 18½.

[In Janvier (Thomas A.) The Mexican Guide. 5th ed. 16°. New York, C. Scribner's Sons, 1890, at end.]

L. C.

1886.

Mexico. 16½ x 23.

[In Janvier (Thomas A.) The Mexican Guide. 5th ed. 16°. New York, C. Scribner's Sons, 1890, at end.]

NOTE.—Map copyrighted in 1886, by W. M. Bradley & Bro.

1886.

Outline map of field operations against hostile Chihuahua Indians, 1:950,400 (15 miles to the inch). By Lieut. E. J. Spencer, C. of E., engr. officer, department of Arizona. 1886.

U. S. War Dept. lib.

1887.

Carta telegráfica y ferrocarrilera de la República Mexicana. Dirección general de estadística, secretaría de fomento, 1887. Escala de 1:3000000. 27¾ x 37½.

L. C.

1888.

Carta general de la República de Méjico y de los Estados Unidos del Norte, con relación á las propiedades de la Compañía minera de fierro mejicana. Scale: 1:3800000. 32½ x 44½. New York, G. W. & C. B. Colton & Co., [1888].

L. C.

1889.

Bancroft's map of the mineral districts of northern Lower California. Designed by Fred J. Engelhardt, March 1, 1889. Compiled from official authentic maps and sketches [on record] from special investigation in person and assisted by the oldest and most expert Mexican prospectors, 1888-1889. 16½ x 19. San Francisco, The Bancroft company, 1889.

L. C.

1889.

Bosquejo de una carta geológica de la República Mexicana. Formada por disposición del Secretario de Fomento, Gral. Carlos Pacheco, por una comisión especial bajo la dirección del profesor Antonio del Castillo, 1889. Escala de 3,800,000°. 29 x 41¼. Paris, Erhard hermanos, [1889].

L. C.

1889.

Cartes commerciales—Etats-Unis du Mexique (1st pt., north Mexico; 2d pt., south Mexico), 1:3000000. F. Bianconi, Paris, 1889. (Forms 7th series, nos. 4 and 5, of geographical memoirs published by Chaix, Paris).

U. S. War Dept. lib.

1888.

Memoria para la carta general geográfica de la República Mexicana. Año de 1889. 27 pp., 1 l. 8°. México, Oficina tip. de la Secretaría de Fomento, 1890.

L. C.

1889.

Mexico. 1:4435200. (70 miles to inch.) Bradley & Co., Phil., 1889.

U. S. War Dept. lib.

1889.

Plano geológico del Real de S. Antonio y el Triunfo de la Baja California: Formado por Antonio del Castillo, ingeniero de minas. Revisado en 1889. 25½ x 21½. México, E. M. Moreau y ho. [1889].

NOTE.—Inset "Estremidad sur de la península de la Baja California. Bosquejo Geológico."

L. C.

1889.

United States with adjacent portions of Mexico. 1885. Corrected to 1889. Scale, 1:5000000. 4 sheets.

U. S. War Dept. lib.

1890.

Carta general de la República Mexicana. Formada en el Ministerio de Fomento con los datos más recientes, por disposición del secretario del ramo, General Carlos Pacheco, 1890. Escala de 1:2000000. 44½ x 68. Paris, Erhard hermanos. [1890].

L. C.

1890.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. Secretaría de Fomento, sección tercera. Escala: 1:2000000. 44½ x 66. Paris, Erhard hermanos, 1890.

L. C.

[1890]?

Carta minera de la República Mexicana. Formada por disposición del Secretario de Fomento, Gral. Carlos Castillo. Escala de 3,000,000. 29 x 41½. Paris, Erhard hermanos [1890]?

1891.

Map of Mexico, prepared under the direction of Captain Daniel M. Taylor, Ordnance Department, and 1st Lieutenant George P. Scriven, Signal Corps, in the military information division, Adjutant-General's Office, War Department; William N. Peck, chief of division, by Charles H. Ourand, draughtsman. 1891. 30¾ x 40½.

L. C.

1891.

Rand, McNally & Co.'s indexed Atlas of the World. Map of Mexico. Statute miles, 69.16—1 degree. Kilometers, 111.307—1 degree. 19 x 26. Chicago, Rand, McNally & Co., 1891.

NOTE.—Inset of "Valley of Mexico on an enlarged scale."

L. C.

1891.

Reducción del plano oficial de la ciudad de México. Levantado de orden del H. Ayuntamiento por la Comisión de saneamiento y desagüe en 1889 y 1890 detallado ampliamente y publicado por la antigua y acreditada casa C. Montauriol y ca., 1891. 29 x 38½.

L. C.

1891-1892.

Carta de la República. 1:100000 1 Bl. 18. I. M. México.—N. Tetzmeloccan.—O. Huamantla.—S. Popocatepetl.—T. Puebla.—H. K. Llanos.—P. Chalchicomula.—U. Tlacoyalco.—V. Orizaba.—Iv. A. Tehuacán. México, Secretaría de Fomento. Carte des États-Unis du Mexique dressée par les soins de la Société de géographie de Lille d'après les plus récents documents officiels. B. S. géogr. Lille 18. Diaz, A., Carta topográfica general de los alrededores de Puebla, formada por la Comisión Geográfica Exploradora. Edición de 1884. (3^e série.) 1:50000. Paris, impr. Erhard. Jaccottey, P., et M. Mabyre, Carte des services maritimes postaux des Antilles et du Mexique. Paris, Delagrave, édit. Rand, McNally & Co.'s indexed (pocket) map of Mexico. New York and Chicago. cl.

Taken from "Bibliotheca geographica," 1891 and 1892.

1891-1893.

Bosquejo de una carta geológica de la República Mexicana. Formada por disposición del Secretario de Fomento por una comisión especial bajo la dirección de Antonio del Castillo. Reformada con nuevos datos en 1891, 1892 y 1893. Escala: 1:10000000. 10½ x 14½. México, E. M. Moreau, [1893].

L. C.

1891-1896.

Report of the international boundary commission. United States and Mexico. 1891-1896. Map title. 26 maps. fol. Washington, Government Printing Office, 1898.

List of maps.

Index map of the boundary.
California line.
Colorado River section of the boundary (in colors).
Arizona—Sonora oblong line.
Parallel 31° 20' north latitude.
Meridian section.
Parallel 31° 47' north latitude.
Profile of the boundary.

L. C.

1892.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. 1:2000000. 1890. Corrected to 1892. Published by the Mexican Government.

U. S. War Dept. lib.

1892.

Map of Mexico. About 1:3000000 (45 miles to inch). By C. H. Ourand. Published by Bureau of Military Information, War Department, 1891. Revised ed., 1892.

U. S. War Dept. lib.

1892-1893.

Krater-Typen in Mexico und Guatemala. Nach Aufnahmen von Dr. Carl Sapper, 1892 und 1893. 12 x 8½. [In Petermann's Mittheilungen, 1894. 4^o. Gotha, J. Perthes, [1894]. v. 40, pl. 8 at end.]

L. C.

1893.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. 1893.

U. S. War Dept. lib.

1893.

Carta de los meteoritos de México, ó regiones de la República en que han caído fierros y piedras meteóricas. Formada, bajo los auspicios de la Secretaría de Fomento, por Antonio del Castillo, ingeniero de minas, director de la Escuela Nacional de Ingenieros y de la Comisión Geológica. Escala: 1:10000000. $14\frac{3}{4} \times 10\frac{1}{2}$. México, Moreau y ho., [1893]. L. C.

1893.

Carta minera de la República Mexicana. Formada, por disposición del Secretario de Fomento, por el ingeniero de minas, Antonio del Castillo. Corregida en 1893. Escala: 1:2000000. $42\frac{1}{2} \times 66$. México, E. M. Moreau y ho., [1893].

1893.

Plano de la ciudad de México. $10\frac{1}{2} \times 15\frac{1}{2}$. [In Diccionario enciclopédico hispano-americano. 8°. Barcelona, Montaner & Simón, 1893. v. 12, bet. pp. 740-741.] L. C.

1893.

Castillo (Antonio del).—Bosquejo de una carta geológica de la República Mexicana. 1:10000000. Comisión Geológica Mexicana. México.

— Carta de los meteoritos de México, ó regiones de la República en que han caído fierros y piedras meteóricas. 1:10000000. Comisión Geológica Mexicana. México.

— Cartas geológicas de pozos artesianos abiertos en la Gran Cuenca de México. Comisión Geológica Mexicana. México.

— Plano geológico del Peñón de los Baños. 1:4000. Comisión Geológica Mexicana. México.

— Plano geológico y petrográfico de la Cuenca de México, region sw. 1:2000000. Comisión Geológica Mexicana. México.

— Cabañas L. y Ordoñez E. Plano geológico de las minas de fierro de la Ferriera, de la Encarnación y del distrito minero de S. José del Oro. 1:20000. Comisión Geológica Mexicana. México.

Taken from "Bibliotheca Geographica, 1893."

1893.

Plano geológico y petrográfico de la cuenca de México, region SW. Formado por Antonio del Castillo y Ezequiel Ordoñez, 1893. No. 1—SW. de la cuenca de México. Escala: 1:200000. 10×18 . México, E. M. Moreau y ho., [1893].

1894.

Carta general del Estado de S. Luis Potosí. Levantada por iniciativa de su actual gobernador, Gral. Carlos Díez Gutierrez, por la Comisión Geográfico-exploradora. México, 1894. Scale, 1:250000, or 4 stat. miles to an inch. 12 sheets.

NOTE.—The scale on which this map is drawn is sufficiently large to admit of a considerable amount of detail being shown. The altitudes are given in metres and all means of communication are laid down. On the different sheets of the map some useful statistical and geographical information is given in tabular form, together with insets showing the political divisions and geographical positions. The hill shading employed is effective, the rivers and streams are printed in blue, and the lettering clear.

Title taken from the Geographical Journal, London, 1896. v. VII, no. 1.

1894.

Ferrocarriles de Hidalgo y del Nordeste; plano general. 1:250000. 1894.

U. S. War Dept. lib.

1894.

Mexico. $17\frac{1}{2} \times 23\frac{1}{2}$. [Philadelphia], W. M. Bradley & Bro. 1894.

NOTE.—From Bradley's atlas of the world. p. 73. Philadelphia, 1885.

L. C.

1894.

Karte der Verbreitung der Sprachen in Südost-Mexico und Britisch Honduras um's Jahr 1894. Von Dr. Karl Sapper. Massstab: 1:4000000. $9\frac{3}{4} \times 12\frac{1}{2}$.

[In Petermann's Mittheilungen. 1895. 4^o. Gotha, J. Perthes, [1895]. v. 41, pl. 12 at end.]

L. C.

1894.

Map of the United States of Mexico. Drawn and compiled from the latest Mexican and United States Government authorities, and other reliable sources. By Oscar Hindrichs, C. E. Scale, 1:5385600. $16\frac{1}{2} \times 22\frac{1}{2}$. [In Moore (Henry). Railway guide of the Republic of Mexico. Springfield, O. Huben & More, 1894.]

L. C.

1894.

A general map of the Republic of Mexico, by Brigadier-General Pedro García Conde, engraved from original survey by order of the Mexican government, and colored to show the departments. The capitals of departments, cities, towns, villages, and farms are given; also military centres, anchorages, etc. Four sheets; 50×37 inches; 64 miles to an inch (1:055040).

NOTE.—Title from Stanford's Catalogue of maps. London, Oct. 1894.

British Museum catalogue of maps mentions editions of 1845 and 1848 (?) of this map.

1895.

Chavez (E. A.). República Mexicana. Recto: Carta muda de geografía física. Verso: Carta muda de geografía política. Paris, impr. lithog. Ve. Bouret.

— Carta general de los Estados Unidos Mexicanos, según los últimos datos, formada bajo la dirección de Ezequiel A. Chavez, para uso de las escuelas primarias de la República. Échelle: $\frac{1}{2}$, 683,44. Cartes muette et avec lettres. Paris, 1895. Imp. Monrocq; lib. Bouret.

Taken from "Bibliotheca Geographica, 1895."

1895.

Map of Mexico. 9×10 .

[In Campbell (Rean). Campbell's complete guide and descriptive book of Mexico. 12^o. Chicago, 1895.]

L. C.

1895–1896.

Carta de comunicaciones de los Estados Unidos Mexicanos. Formada de órden de la Secretaría de Estado y del Despacho de Comunicaciones y Obras Públicas por el Coronel Bodo von Glümer. Escala: 1:1000000. 1895–1896. 2 sheets each, 51×93 . Berlin, grabado é impreso en el Instituto Litográfico, 1895–96.

L. C.

1896.

Carta de la República Mexicana, á la 100000^a. Secretaría de Estado y del Despacho de Fomento. Comisión geográfica de Guerra y Fomento bajo la dirección del ing. A. Diaz. Dib. y escrit.: J. Lopez. Constr. y config.: Ing. R. Sandoval. I^a edición, 1888.—Publicada en 1896. I^a serie. Hoja-19-1 (Y). $16\frac{1}{4} \times 22$.

L. C.

1896.

The valley of Mexico. To illustrate the paper by O. H. Howarth. 1:15000000, or 1 inch=8 miles. $8\frac{1}{4} \times 7\frac{3}{4}$.

[In Royal Geographical Society Journal, 1896. 8°. London, 1896, v. 8, p. 200.]

L. C.

1897.

Carta de la República Mexicana, á la 100000^a. Secretaría de Estado y del Despacho de Fomento. Comisión geográfica de Guerra y Fomento bajo la dirección del ing. A. Diaz. Constr. y dib.: E. Estrada. Config.: C. Rivera. Escrib.: J. Samaniego. Bajo la inspecc. del Ing. C. T. Alvarez. 1^a edición, 1893.—Publicada en 1897. 1^a serie. Hoja-51-(L). $16\frac{3}{4} \times 22$.

L. C.

1897.

Geologische Karte von den Vereinigten Staaten und Mexiko. Massstab: 1:20000000. $8\frac{1}{2} \times 10\frac{1}{2}$.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. 1897, v. 17, bet. pp. 230-231.]

L. C.

1897.

Mexiko. Massstab: 1:12000000. $8\frac{1}{4} \times 10\frac{1}{2}$.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. Leipzig und Wien, Bibliographisches Institut, 1897. v. 12, bet. pp. 234-235.]

L. C.

1897.

Mexiko. Massstab: 1:12000000. $8\frac{1}{2} \times 11$.

[In Brockhaus' Konversations-Lexikon. 14te Aufl. 8°. Leipzig, F. A. Brockhaus, 1895. v. 11, bet. pp. 840-841.]

L. C.

1897.

Mexique. Échelle du 10,000,000^e. Gravé et imp. par Erhard fres., 1897. 10×14 .

[In Grande (La) Encyclopédie. 8°. Paris, H. Lamirault & Cie., [1885-98]. v. 23, bet. pp. 864-865.]

L. C.

1897.

A section of north Mexico showing the journeys of J. Gurdon L. Stephenson, F. R. G. S., and A. Krauss, F. R. G. S., 1897. Scale, 1:1250000 or 1 inch=19.7 miles. 27×14 .

[In Royal Geographical Society. Journal, 1898. 8°. London, 1898. v. 11, p. 464.]

L. C.

1897.

The Century Atlas. Mexico. $10\frac{1}{2} \times 15$. New York, the Century Co., 1897.

L. C.

1897.

The Century Atlas. Mexico, central portion. $10\frac{1}{2} \times 15$. New York, the Century Co. 1897.

L. C.

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Vereinigte Staaten und Mexiko. Massstab: 1:20000000. $8\frac{1}{2} \times 10\frac{1}{2}$.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. Leipzig und Wien, Bibliographisches Institut, 1897. v. 17, bet. pp. 224-225.]

L. C.

1898.

Mexico. Scales statute miles, 69.16—1 degree. Kilometres, 111.307—1 degree. 19 x 26. Chicago, Rand, McNally & Co., 1898.

NOTE.—From Rand, McNally & Company's indexed Atlas of the World. Inset "Map of the valley of Mexico on enlarged scale."

L. C.

1898.

Rand, McNally & Co.'s indexed State and railroad map of Mexico, showing the railroads, islands, lakes, mountains, rivers, States, towns and villages. 61 pp. 1 fold. map. 18°. Chicago and New York, Rand, McNally & Co. [1898].

1900.

Mexico. From official Mexican and other sources. Scale, 50 miles to the inch. Size, 39 x 28½. Prepared by the Bureau of the American Republics. Washington, 1900.

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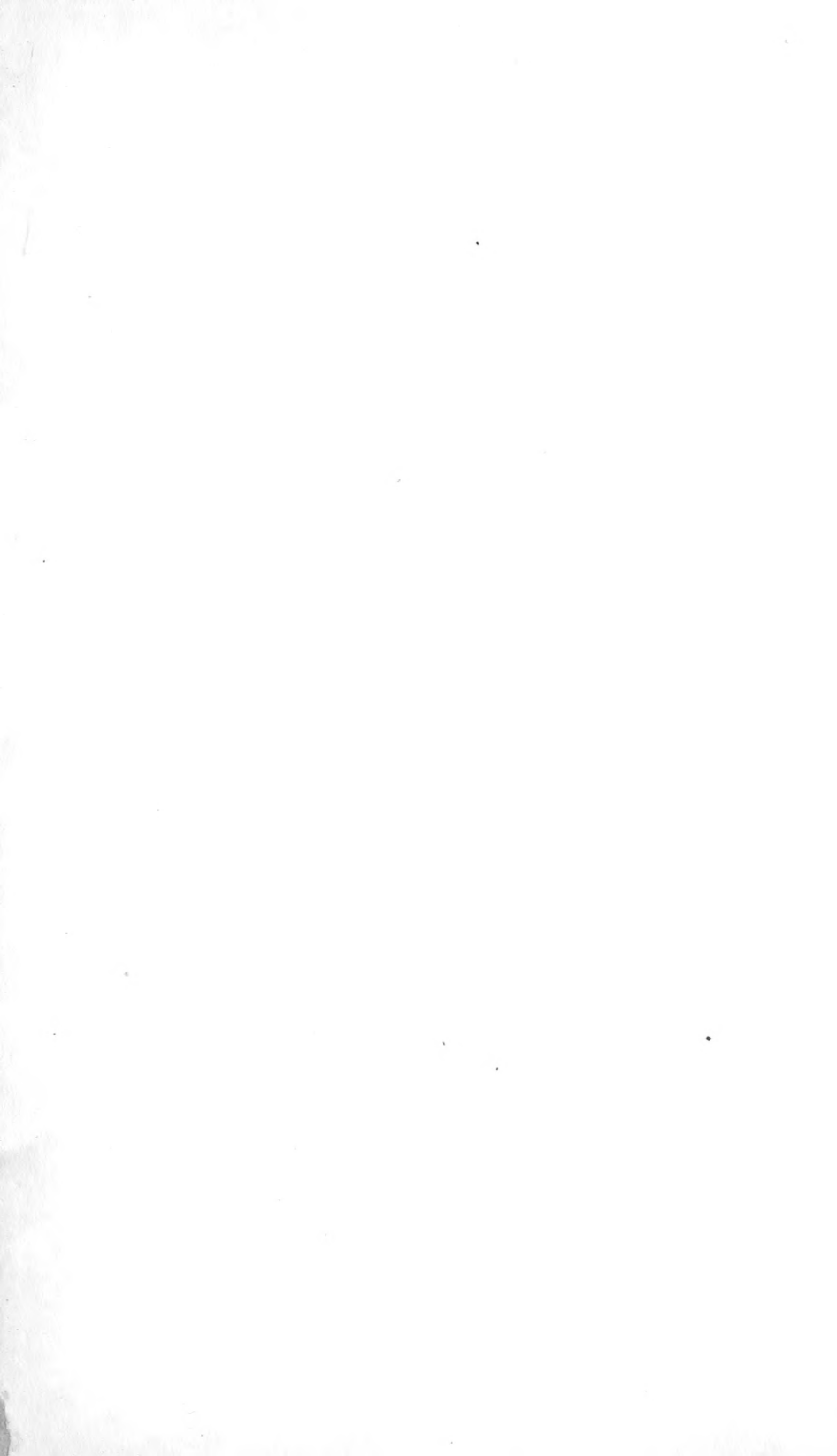
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